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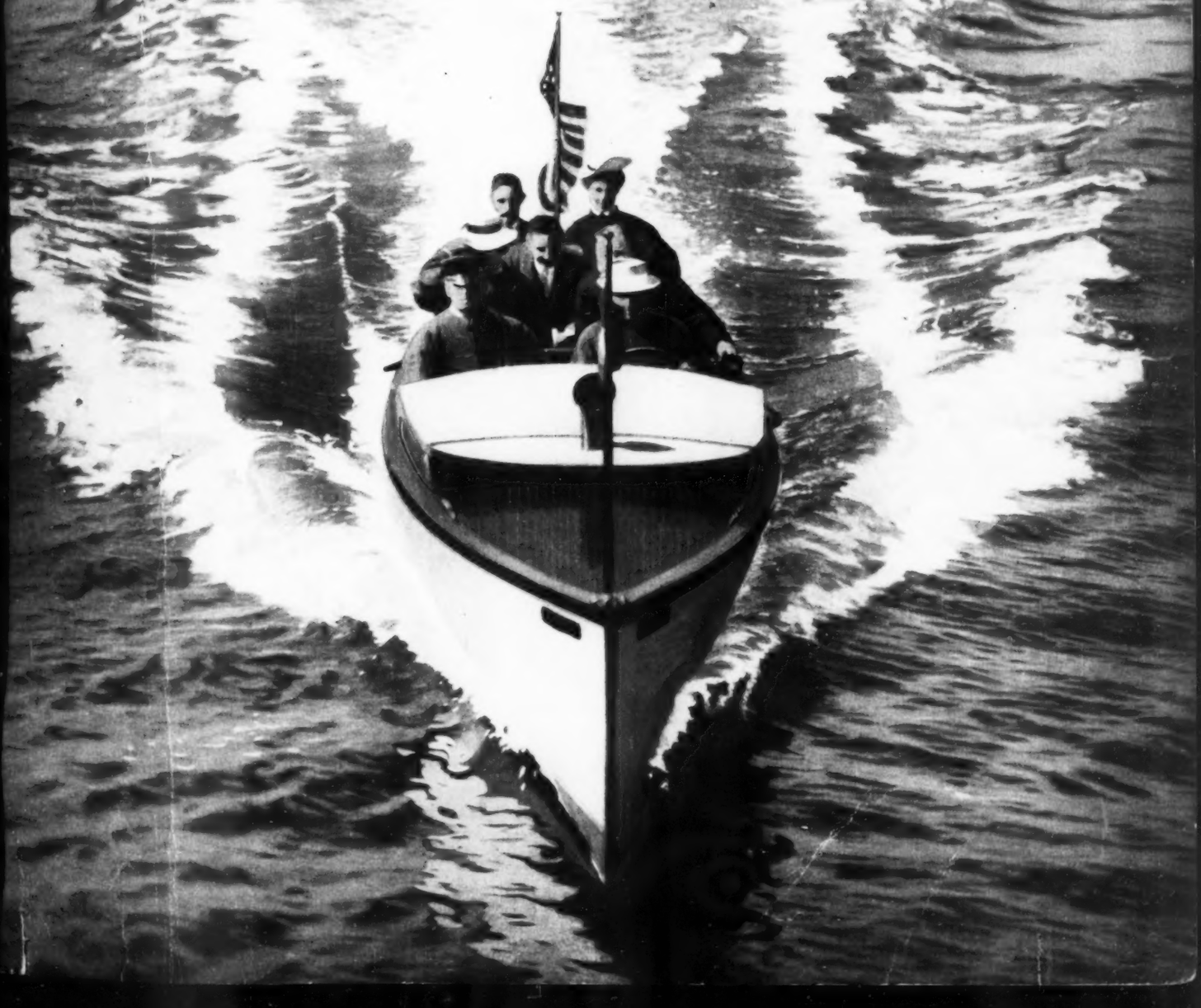

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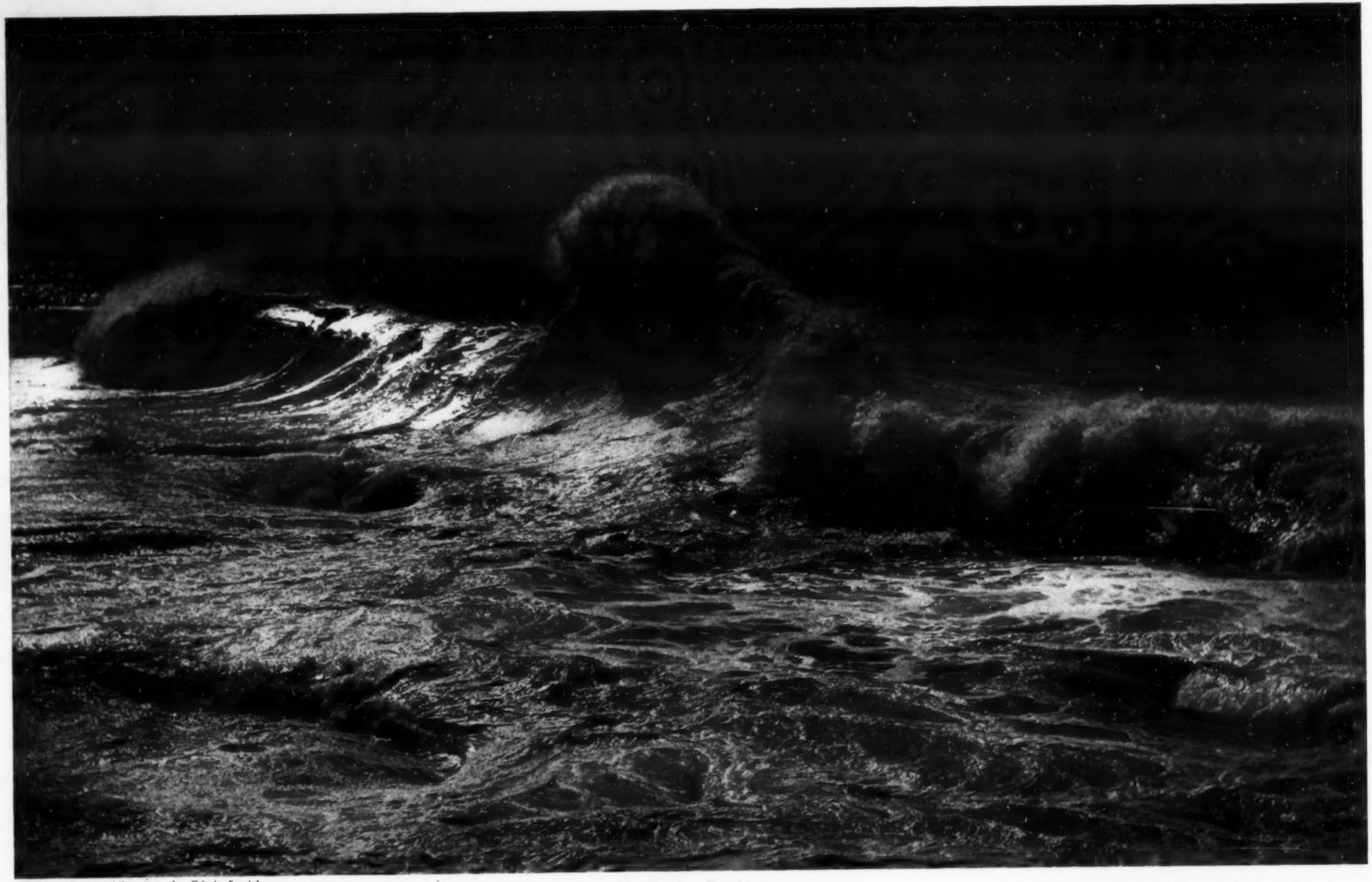


Photograph copyright, 1910, by Edwin Levick.

The Restless Breakers.

MOTOR BOATING SURF SERIES, NO. 2.—This is the second of a series of remarkable surf pictures, begun in the last number of MOTOR BOATING and which will continue for several successive issues.

tures, begun in the last number of MOTOR BOATING and which will continue for several successive issues.

MOTOR BOATING

THE NATIONAL MAGAZINE OF MOTOR BOATING

And Now's the Time For Fitting Out.

Things in the Boat Yard Begin to Move and Overboard Go the Boats. A Word or Two on Overhauling, What's to be Done Before the Season Opens.

NOW that the winter is behind us and the approach of spring brings with it an occasional warm day, the motor boatman tired of the inactivity of the winter begins to think about overhauling his boat. The water fronts take on a new aspect; the boat yards that were but lately such deserted places are converted into scenes of activity and the sound of the calking hammer mingles with the songs of the returning birds. All this is but the manifestation of the dreams for the coming season and the plans for fitting out that have been accumulating since the boats were hauled out in the fall; a result as inevitable as the swelling buds and the starting sap.

If you are the happy possessor of a large boat you probably will tell the boat builder to start work and put her into commission and launch her already for you to step aboard. But many of the owners of small boats prefer to do the work of fitting out themselves. Whether they can afford it or not they are not content to entrust this work to others; in fact, they consider it recreation and not work at all. It is for this class that these few timely suggestions are made.

It is well to obey the impulse, begin early in order that the job may be done thoroughly, for once the season is here and the other boats begin to go overboard there is sure to be a tendency to slight the remainder of the work, and the chances are that if not done thoroughly at the start it will be neglected altogether.

You probably have left the engine in the boat during the winter. If it has seen hard usage during the past season and you have not overhauled it in the fall, get to work on it first, as it does not improve fresh paint and varnish to have the sundry parts of an engine hauled over them. After removing all connections take down the engine and thoroughly clean out the accumulation of carbon. Remove the piston rings and replace if worn, being careful to get the laps spaced around the piston. If there are any badly worn parts, replace them now, so that they will not give out entirely during the summer and cause a week or two of delay while waiting for new ones to be shipped from the factory. Go over the wiring carefully and if there are any worn places in the insulation replace with new wire. If the coil has been left in the boat during the winter it probably will not be in good condition and will need new vibrators if the old ones are rusty or worn. Repack the pump if it is of the plunger type and get new gaskets for the cylinder heads and base unless you find that the old ones are in perfect condition. Be sure to re-pack the stuffing box and tighten the log screws, holding it to the shaft log.

If the hull is in good condition, repainting and varnishing probably will be sufficient. But if in need of calking or repairing all the old paint and varnish should first be removed, as a perfect job cannot be done otherwise. You will have to use one of the prepared chemical paint and varnish removers or else a painter's gasoline torch and scraper. Get all the old finish off right down to the bare wood and then you will be ready to make all the repairs to the hull that are necessary.

If the boat leaked last season remove the old cotton from the leaky seams and re-calk. Go over all the seams carefully and putty up wherever the old filling has dropped out and after this is done the outside is ready to be painted. It is not advisable to put on the final coat, however, until the boat is ready for the water, as it is bound to become dirty from the rest of the work that is to be done on the decks and interior.

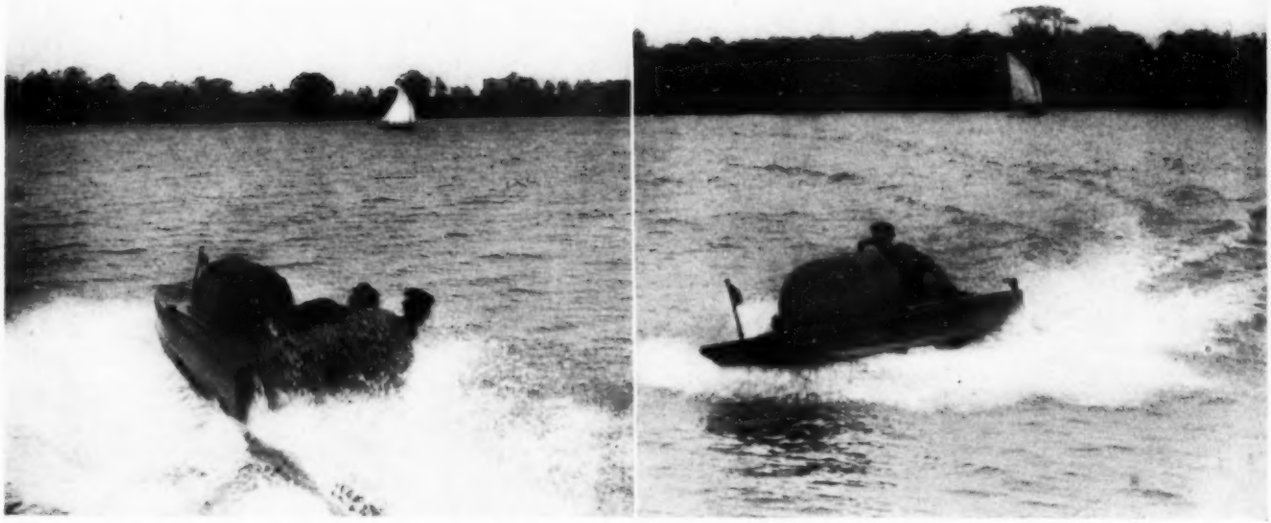
Before starting on the interior it should be thoroughly cleaned out with a stiff brush and flushed with a strong solution of washing soda and water. Clean the gasoline and fresh water tanks with this same solution and allow them to dry out thoroughly. If any timbers are found to be split or broken either replace them or bend in new ones beside them, and fasten through both the planks and the old timber, for if one is broken the rest are likely to follow in short order, especially at the turn of the bilge.

Give all the parts under the floors and behind the lockers a coat of paint, and when this is done you will be ready to look after the bright work. In case these parts of the boat are to be entirely refinished all the cleats, chocks, sockets and other fittings should be removed, as only in this way may the work be done thoroughly.

Make a solution of oxalic acid and warm water and apply it to the bright work with a brush unless it is mahogany. Do not use acid on mahogany as it is liable to turn it black. It should be either scraped or sandpapered clean. On oak, pine or cedar the acid will bleach the wood so that it will look like new. Always apply vinegar with a brush after using acid for if you do not the varnish will soon peel off. After the wood is dry sandpaper first with a coarse grade, say number 2½ and finish with number 1 or 1½, being careful to sandpaper with the grain of the wood. Thoroughly clean off all dirt and dust and apply several thin coats of varnish. After thoroughly cleaning and polishing replace the brass fittings and the boat should look like new.

See that the rudder and steering gear are in good condition, paying particular attention to the pintles and shoe.

After applying the final coat of paint to the outside of the hull she is now ready to go overboard, but as every boat and every place present different conditions and problems it would be hard to give any directions covering all cases. There are usually other boats in the vicinity undergoing the same treatment, and with the help of the other fellows a few planks and some rollers it is not a very difficult job to put the boat overboard, and you are a poor boatman indeed if when she slides in you do not feel that you are fully repaid for all the labor you have spent on her.



Dollydo II. She is of the two-plane box type, is 13 feet by 4 feet, and has attained a speed of some 24 miles.

Hydroplane Development in England.

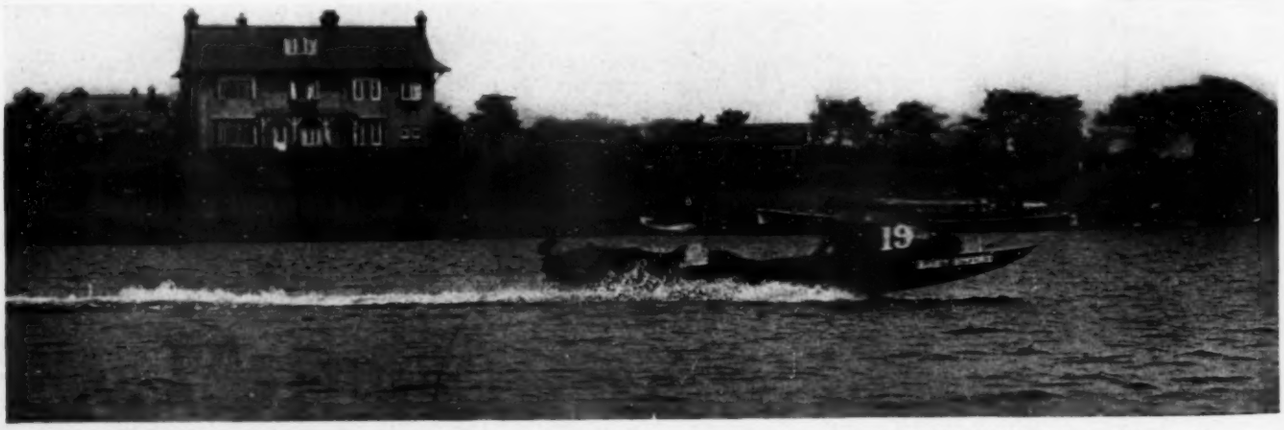
What the British Designers Have Done and Are Doing with this Type of Speed Craft. The Possibilities of a Hydroplane in the British International.

By J. Rendell Wilson.

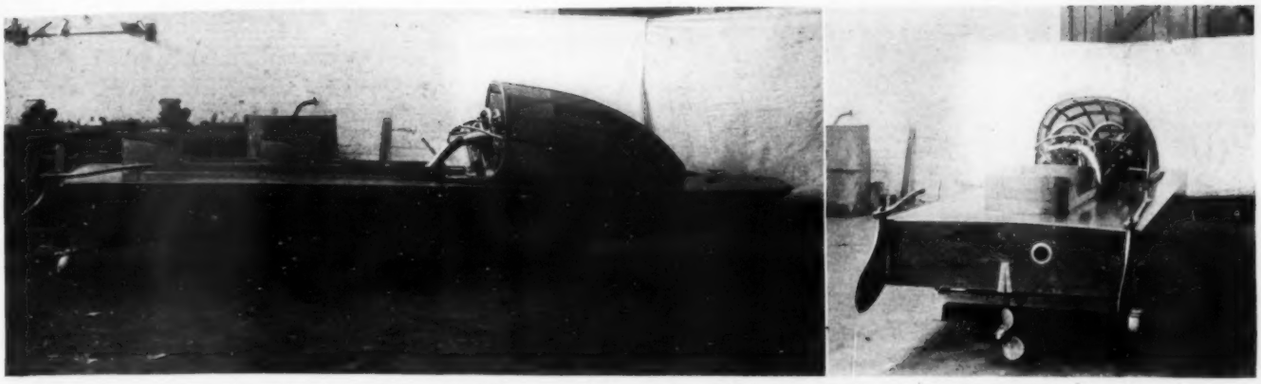
ABOUT two years ago a startling report appeared in the press that a mysterious little boat had been seen in Southampton water traveling at an extraordinary speed. Rumor for once was true, and a few days afterward the craft paid literally a flying visit to the Enchantress, the floating headquarters of the Motor Yacht Club. She turned out to be Ricochet X, a little 13 ft. hydroplane of French construction, fitted with a 12 H. P. Anzani motor. She gave a number of demonstration runs attaining no less than 23 miles per hour. Her wonderful performance attracted great attention, and during the remainder of the season club chats were principally about "animated tea trays," as the motor-boatists then nick-named that boat. Up to then hydroplanes had been given but little notice, but from that time on some interesting data leaked out bit by bit, and their early history is worthy of narration.

Early in the year 1872 some interesting experiments were carried out by the Rev. C. M. Ramus, of Rye, Sussex, with model two and three-step hydroplanes, or "Bhisphenic" and "Polysphenic" ships as the inventor termed them. He placed his invention before the Admiralty, who also experimented with the models, but, as is usual with British Government "red-tape," allowed the matter to drop shortly afterwards. Five years later Sir John Thoryncroft, the head of the famous firm of torpedo-boat destroyer builders, produced a single step model which he patented. The results of further experiments were not made public by Sir John, until early last year when he read a paper on the subject before the Royal Automobile Club. A few months afterward his experiments took practical form in the launching of Miranda, a wonderful boat, which I shall describe later, and in a larger and faster craft which is now on the stocks, and which will probably come to America as a British International Trophy challenger. The construction work is being carried out in secret and particulars are not obtainable, except that a speed of over 45 miles per hour is practically certain.

To continue with the history of hydroplanes, the first practical English "skimmer," as this type of boat should correctly be termed, was Sleuthhound, a Wilesmith built boat, owned by a Mr. Robinson who steered her in several races during the years 1907 and 1908; but, as there was nothing startling about her speed, she did not cause much comment. In the autumn of 1908 a hydroplane of the two-plane variety was tried with success on the Norfolk Broads, and over 20 miles per hour was reached with only 12 H. P. Surprise, as the little craft was named, was owned by Mr. M. Brooke, of Lowestoft, and had a length of 13 ft. with 5 ft 6 in. beam. She was built purely for experimental purposes, so did not



Baby Hydro at 25 miles an hour. Note the position of the helmsman who is steering by rolling his body from side to side.



Baby Hydro out of water. The two rudders are shown in the stern view and the steps and seating arrangement in the side view.

take part in any of the public speed contests.

Last year saw a considerable improvement in the development, and no fewer than seven successful hydroplanes were launched and appeared in various races, namely:—

Miranda III, Baby-Hydro, Dollydo II, Glisseuse, Flapper, Two-step and Mr. Tom Thornycroft's Glider. Besides these there were several unsuccessful boats, which absolutely refused to be coaxed by their owners and planes. Of the first mentioned undoubtedly the most remarkable was Miranda III, designed by Sir John Thornycroft. On her trials she maintained a speed of over 30 miles per hour on a mean of seven runs with and against the tide over a measured half-mile, yet she was equipped with only a 55 H. P. Thornycroft motor. She presented an entirely new departure in hull design, so her appearance caused great excitement among the marine motoring fraternity. Unlike most hydroplanes she is essentially a sea boat, and from her looks one would think that she is only capable of about eight miles per hour instead of four times that speed. Her length is 24 ft. and the beam 7 ft., the point of greatest beam being well forward of amidships, while the stern finishes to a point, a direct contrast to modern power boats. With regard to her under-water lines there is a small foot, or aqua-plane under her bow, while towards aft she has an egg-shaped flat bottom, with the small end at the stern. When the engine throttle is opened, and the boat moves, the forward plane rises clear of the water, then the after body hits gradually, the speed increasing at the same time. At a certain point the stern comes clear of the water and the bow drops until the aquaplane just touches the surface. The boat immediately leaps forward at full speed, the whole operation of rising to the surface only taking about 10 seconds.

"Like father, like son," and Mr. Tom Thornycroft has followed in his father's footsteps by designing and building a "glider," with which he obtained about 26 miles per hour with but 30 H. P. His boat has a single plane only, with the exception of a small sump in the bottom of the hull into which the motor is installed. There is no rudder, she being steered by a short paddle.

Baby-Hydro, Dollydo II and Two-Step are all of the "Ricochet" or two-plane box type, and have all attained a speed of about 24 miles per hour. The first mentioned is 15 ft. in length and is fitted with a two-cylinder V type 12 H. P. Brooke motor, while Dollydo II is two ft. shorter with a 4 ft. beam, and is installed with a two-cylinder Boulton and Paul engine, developing 13 H. P. at 1,300 revolutions. The total hull and engine weight of Dollydo II is 548 lbs.; the hull weighing 250 lbs. The under water section increases

Mr. Tom Thornycroft on his latest "skimmer."

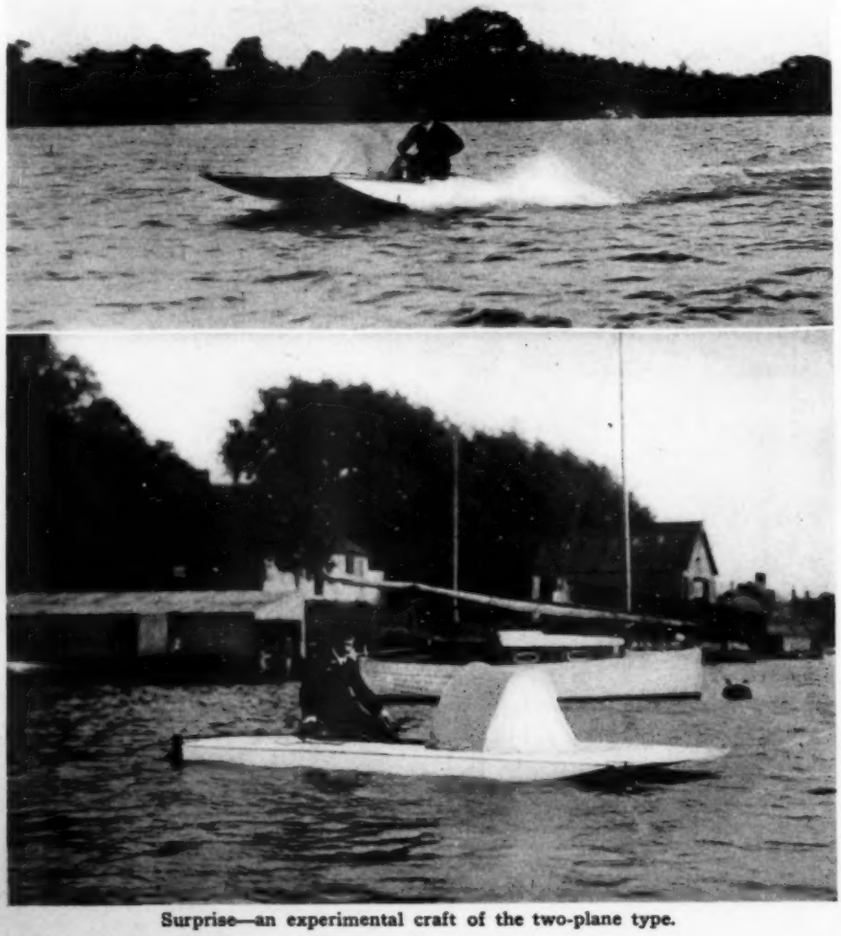
Miranda III. She has suggested new possibilities in the hydroplane field.

The Thornycroft "glider." She has a single plane and runs up to 26 miles.

from fore to aft where it is perfectly flat on the transom. The reason for this was to overcome the tremendous sectional resistance against the skin of the boat when lifting out of the water. Two-Step was built by Wilesmith of Sleuthound fame, and is also 13 ft. in length, with a total weight of about 450 lbs. Her Coventry-Simplex engine develops 15 H. P. at 1,500 revolutions, and has four cylinders.

Flapper is a miniature Miranda, being built on much the same lines. At present she is having her old engine taken out, with which she obtained a high speed and is being fitted with a more powerful equipment, from which 40 miles per hour is expected. The only Fauber, or multiplane type, hydroplane successfully run in England is Glisseuse, Lord Hardwick's little boat. She is about 18 feet in length and is fitted with an Anzani motor, but as she did not make an appearance until the end of last season her speeds are not authentic.

From the foregoing it will be seen that last year saw a wonderful hydroplane development in England. Excellent progress was also made in France, but of that I shall not deal here, although two French hydroplanes accomplished 40 miles per hour during a short burst of speed at Monaco. But the coming season will show a far more wonderful improvement in the shape of the Hope-Rathbone patent multi-step hydroplane from which is expected the astounding speed of over 50 miles per hour with 120 H. P., yet retaining the ordinary seaworthy qualities of a racing launch. As I write negotiations are being made for her construction, and there is every likelihood of her being brought to America, in company with the new Thornycroft boat, to win back the B. I. Trophy. If so, there is no doubt that Dixie III will have to look to her laurels. Coming from such a reliable source (as Mr. Linton Hope, the designer, is a naval architect of unimpeachable standing), there is no doubt that the speeds will be obtained, and Mr. Hope has checked and rechecked his figures until there can be no shadow of doubt of their accuracy. When the hull is built two 60 H. P. E. N. V. engines will be fitted. Although of Belgian design the engines are being made in England expressly to allow of the boat being eligible to enter for the Trophy race.



Surprise—an experimental craft of the two-plane type.

It is a source of surprise and wonder to the author that the hydroplane boom has not spread to America and taken the country by storm. The magnificent rivers and other sheltered waters are far more suitable for hydroplanes of the "animated tea tray" type, than are the exposed waters round the British Isles. Also that the sensations and delights of an expensive high-powered speed-boat can be obtained for a few hundred dollars, by building one of these marvelous little craft. About 15 H. P. in a 14 ft. hull of the two-plane variety is quite sufficient to obtain 25 miles per hour, if careful attention is paid to the design and position of the planes. The hydroplane therefore promises to be the means of bringing the higher speeds within the reach of all.

The Coming Season on Lake Michigan.

The Development of Speed Contests and Cruising Races on One of the Great Lakes. What the Clubs are Planning for the Summer of Nineteen-Ten.

By Howard I. Shaw.

MOTOR BOAT racing on Lake Michigan has necessarily been confined to the cruising type as the lake is too big and too changeable for the open boats, and will always be so, as almost the entire lake is open and exposed to the elements and is no place for the small boat.

The cruising boat, however, is at home here and has always been popular. The first race of any note was held by the Chicago Power Boat Club, in 1906, to Mackinac Island and at the same time was the longest motor boat race ever held, the distance being three hundred and thirty-four miles. This race was an interesting one and the Dusty Syde, of Detroit, came under her own power the eight hundred miles from Detroit to Chicago, arriving on Friday afternoon and turning around Saturday at one o'clock, raced the three hundred miles back to Mackinac, beating the next boat in by nine hours and still the race and cup were given to the second boat. However this is ancient history. This race was unique in the fact that an open boat contested for the first, and let us hope, the last time. The story of her troubles would fill a book. They arrived safely, however, but it is certain that none of the crew would ever tackle it again.

The Columbia Yacht Club soon took up the motor boat game and, with their advent, racing on Lake Michigan was put into good hands and became one of the most important on their schedule. The club added races for motor boats to their annual Michigan City race which has been run regularly for nineteen years and for the last three years this class has been the only one to finish by daylight. In addition to the Michigan City race the club promoted the race to Mackinac Island and for several years this was the event on Lake Michigan and developed some very fine sport. Incidentally the record made by the Kitchi Gammi of thirty-four hours and twenty minutes still stands for boats under fifty feet. The race to Mackinac, however, grew rather monotonous, and the race was changed to Sturgeon Bay, Wis., and a new feature was added. The long grind to Mackinac was eliminated and the race was changed to a cruising race proper and was arranged so that it was run in legs of about seventy miles a day and a lay up for the night, and the next day the start was made in the order of the finish the day before. This style of racing has proved to be very popular as is evidenced by the increased number of entries each year. In the long grind to Mackinac it was never possible to have more than three or four starters, while in the first race to Sturgeon Bay ten boats started and all finished. Last year twenty-one boats started and most of them finished. This race was extended to Green Bay and accomplished one thing if no other, the starting of the Green Bay Yacht Club, which in one year organized and built a fine club house with a large membership.

These races are more enjoyed than any others in these waters as the boats are tied up for the night and give the crews a chance to get acquainted and an opportunity to enjoy the towns at which the boats stop. They are usually entertained by the yacht clubs or the business men, and at Green Bay last year they were most royally entertained after a grand parade of all the boats up the river, past the town, attended by the local fleet.

The boats after the races north are in the midst of the most charming cruising waters imaginable and most of them take advantage of it and cruise along the north end of Green Bay amid the beautiful islands and bays. The cruise can be extended as far as time will permit. Others, however, leave at once for Mackinac and that paradise of the inland lakes, Georgian Bay, where one may cruise for many days and not go over the same ground.

There is one thing that is noticeable in the Columbia Yacht Club long distance race, and that is that it is a cruise more than it is a race and the paramount feature is the cruise and the contestants are assured of a good time. The race is an incident to the cruise and not the whole thing. If the boat is delayed the race may be lost, but no matter they are bound for God's country and a good time. Defeat therefore loses its sting.

The Jackson Park Yacht Club has also given considerable attention to this class of racing and has promoted some splendid sport. It has an annual cruise to Michigan City, and as its fleet numbers over fifty boats, they could have a club race themselves and have a large list of entries among their own boats. However their races are open as are all the rest and are well attended by the boats of the other clubs.

The Calumet Power Boat Club also has an annual race each fall for a very fine trophy and is well attended. This race is over a course of about twenty miles and is usually held off the mouth of the Calumet River. It as well as the Jackson Park Club holds races for the smaller boats, and as these are never out of sight of land they have been successful, although there have been times when they have encountered a little weather. But they are all good sports and do not mind it. This year they will very likely hold their race on Labor Day under the W. P. B. A. Performance Rule.

The Chicago Yacht Club has never been prominent in motor boat racing. Not that it was averse to promoting events of this kind, but because they never have had anyone who took sufficient interest in it to push it. Their vice-commodore this year is Dr. Thomas H. Gilmer who has always been one of the most enthusiastic motor boatmen in the West, and something in this line should be forthcoming.

Motor boat racing in these waters has developed many famous boats and skippers and interesting stories are told of Dr. Wadsworth Warren and his Dusty Syde. He was among the first, and in a way the Dusty Syde was the forerunner of the present day motor boat, and always attracted a good deal of attention. Tom Bullock's Erin was another of the early ones. Later the Kitchi Gammi, the old war horse, came out and Dr. Gilmer's Sacajawea also came to the front. And still later the Swastika, Commodore Noble's fine craft, which has won so many prizes that it is understood that the Commodore has asked that due bills be given him instead of cups. Arapahoe, Henry Davis's syndicate boat, is another of the ones that glories in the big seas of our big lake. But another story could be written of the many famous boats that have come to front in the past few years.

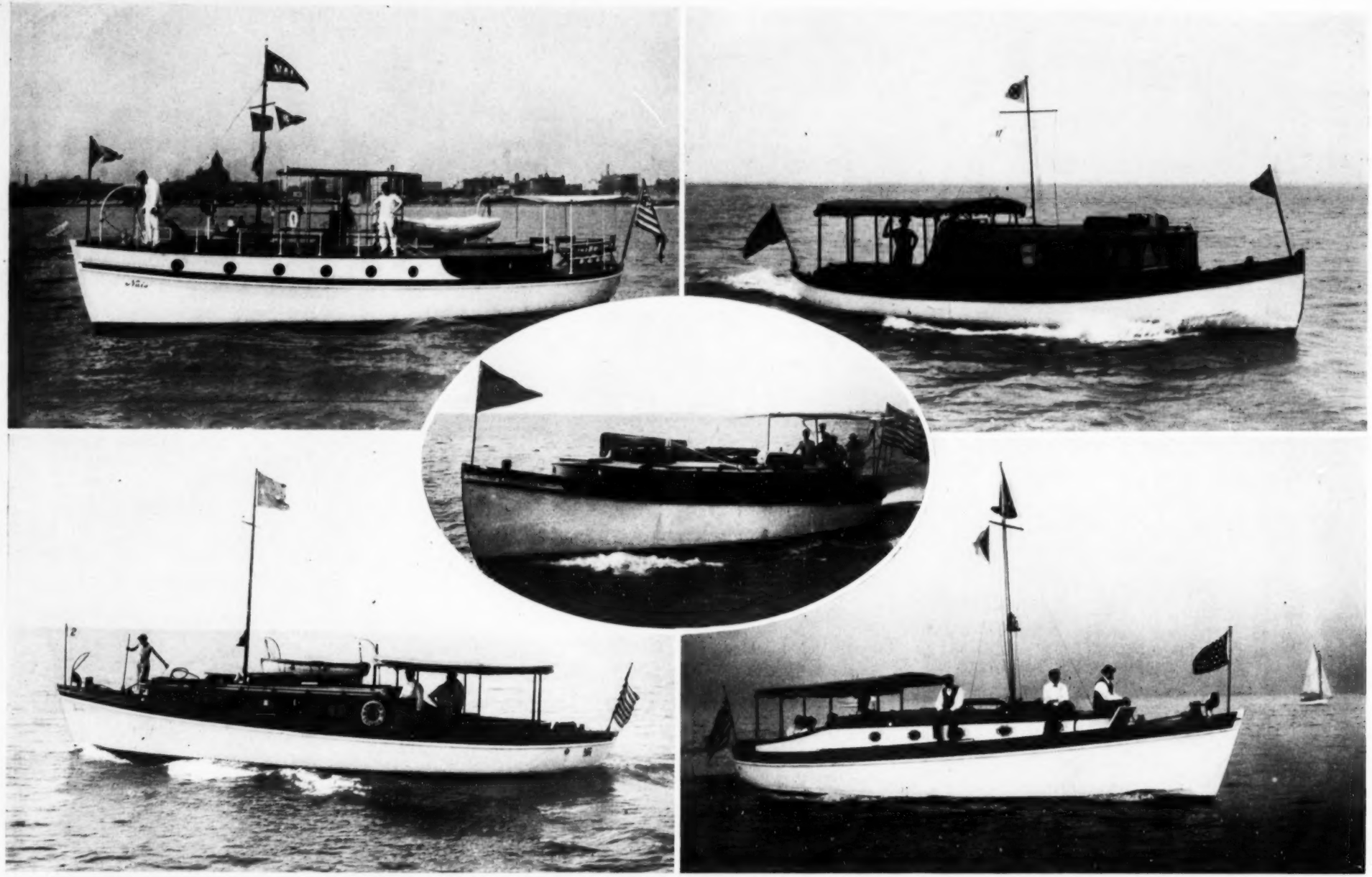
The racing for the coming year will undoubtedly be up to the high standard of the previous years and already the schedules are being made up. The Columbia Yacht Club will hold their motor boat race in connection with their annual Michigan City race and will undoubtedly have the largest list of entries as this is the first race of the season and all the boats will be headed for that race. Anyone who has ever attended one of these races will never willingly miss one.

The long distance race of the Columbia this year will be to Charlevoix, Mich., as the concensus of opinion was that it was time to change. The race had been held for two years up the west shore and it was deemed advisable to lead the fleet into new waters. The start will be made on Saturday morning, July 16th, and the first day's run will be to South Haven, a distance of seventy-eight miles, the next to White Lake, sixty-eight miles, then to Frankfort, ninety miles, and then to Charlevoix, seventy-eight miles—a total distance of three hundred and twenty-two miles.

This will make a very interesting race as each of the ports to be visited are summer resorts, and the races will undoubtedly create much interest and the crews will receive the glad hand from the town people as well as the resorters. South Haven is the scene of many a yacht race in times gone by, and the old yachtsmen are always glad to make the port. White Lake is a beautiful spot and the summer home of many Chicago people, and also the White Lake Yacht Club which always extends the glad hand to visiting yachtsmen. Frankfort is another ideal port and there is a very fine large hotel here which faces Lake Michigan and is one of the show places on the east shore.

Charlevoix is an ideal place to finish a race as it has every thing necessary for the comfort and pleasure of the yachtsmen. It is beautifully situated on the shores of an inland lake some fifteen miles long connected to Lake Michigan by a short channel. Pine Lake is a good harbor, and it has good

(*Continued on page* 50)



Some of the boats prominent in racing on Lake Michigan. Above on left, Nais; on right, Sacajeawea, belonging to Dr. Gilmer; in center, Henry Davis's Arapahoe; below on left, Swastika, Commodore Noble's successful boat, and on right, Wanderer.

Putting the Boat Into Commission.

A Few Timely Hints and Suggestions From the "Brain Pan" of an Old Boatman For Those Who Wish to do the Work Themselves.

By Stillman Taylor.

THE work of fitting out the motor boat plays a very important role in the maintenance of the craft, and to prevent a too rapid deterioration in its condition, and consequently marked depreciation in value, too much care cannot well be taken in looking after the many "little things" which have a direct bearing upon the soundness, usefulness and attractive appearance of the boat. If the yacht is a large, pretentious one, the job of outfitting will entail considerable labor, and this work should be entrusted to competent shipyard hands. However, motor boating is a sport enjoyed by all classes, and the fleet of small craft far outnumbers the larger and costly racing machines and luxuriously fitted deep-sea cruisers. The owner of the small boat is usually his own skipper, engineer, cook and crew, and the greater part of the outfitting labor falls to this selfsame handy man, who is painter, mechanic and carpenter, as occasion may demand. Frequently this work is a labor of love, and the many hours of spare time devoted to restoration are not viewed as irksome labor, but as hours of recreation, pleasantly and wisely spent. Indeed, there is a great deal of enjoyment, not to mention solid satisfaction, in "doing things" with one's own hands, and this familiarity with the chosen craft is, perhaps, the *one* reason why the skipper of the "mosquito fleet" enjoys the sport more keenly than his wealthier, but can we say more fortunate brother?

If the boat has been properly hauled out and protected during the winter months, the work of outfitting in the spring will be largely confined to cleaning, painting and varnishing the hull and overhauling the engine.

As a boat will sweat more or less—due to the difference between the temperature of the air inside and outside of her—the first thing to be attended to, after removing the protecting covering of boards or canvas, is to open up all lockers, skylights, cabin ports and doors, and thoroughly air and dry the interior. This done, the entire ship should be stripped of everything not permanently fastened down and the boat thoroughly cleaned from deck to bilge. A good brushing will remove most of the loose dirt, and a generous scrubbing with hot water —in which a handful of washing powder has been dissolved—will remove all grease and grime and make the craft as neat as the proverbial "new pin."

The engine bed and the flooring underneath should be cleaned out and all grease removed. Particular attention should be directed to the bilge, which should be well cleaned and the limber holes cleaned out, that the water may quickly drain to the well. The pump should likewise come in for its share of attention, as it very probably requires a new strainer. The pipe should be cleaned of any bits of paper, waste or shavings that may have worked through the old gauze. In short, the boat should be carefully and systematically gone over from stem to stern and any needed repairs made at once. A little putty here, a screw or a nail inserted to secure a loose board or sagging hinge, and many other minor repairs will be readily discovered as the work of cleaning proceeds. Make it a point to attend to these details promptly and do not postpone them, lest they be finally forgotten. It is by this methodical attention that proper maintenance is given, and the trite axiom "a stitch in time, etc.," is sound advice which should be followed.

As the greater part of the labor involved in putting the boat into commission lies in the outside wood and metal work, it should be evident to every owner of a boat—be the craft large or small—that painting and varnishing should be properly attended to, not only for the sake of appearance (which is an important factor) but also to prevent deterioration in the form of decay and rust. Paint and varnish are excellent preservatives, but they must be properly applied.

Many amateurs are apt to make a bad job of this important work, either through lack of knowledge as to the needed requirements, or by hurrying through it as if it were a disagreeable task to be performed in the shortest possible time with the least expenditure of care and labor.

In order to turn out a workmanlike and durable job, only the best brands of paint should be purchased. Most old hands generally prefer to mix the pigments according to their particular notion, and as the writer is somewhat old-fashioned about adhering to methods "tried and true," he prefers to mix up the white lead with just a "bit" of oil and thin with pure turpentine. The addition of a small quantity of zinc white will improve the brilliancy of the paint, but it should be used sparingly, however, since zinc dries very hard and brittle, and if too much is used the paint will not be so durable, but have a marked tendency to crack and peel.

The secret of keeping the boat's sides white and smooth, granting that scraping is not necessary, is to first sandpaper well, then touch up the bare spots, and when the surface is perfectly dry, to apply the first coat. For the exterior of the hull it is a decided advantage to use a turpentine paint, which will rub off just enough to keep the surface smooth and the paint flexible. For decks and other woodwork subject to more or less hard wear, a larger amount of oil will be needed, and a little dryer may be used to advantage in mixing paint and enamel for interior finishing.

If the motor needs overhauling it should first be stripped of all connections.

If the amateur has had no experience in grinding and mixing paints, the best and most convenient way is to buy one of the several good brands of ready-mixed paints put up expressly for yacht work. Although ready prepared, these paints should be well stirred before use, that the pigment which settles to the bottom of the can may be thoroughly mixed with the oil. If the paint works too thick to spread smoothly, thin with pure turpentine.

In painting it is well to remember that two or three thin coats well brushed out will do a much better job than one heavy coat, which is almost sure to crack and blister before the season is over. It is therefore much better to take a little more time and give the outside three light coats, letting each coat become perfectly dry before brushing on the next, and thus avoid the greater labor of scraping and burning off the old paint every season or two.

The varnished work of the yacht requires more attention than the painted surfaces, and the "brightwork" should be touched up now and then during the season as it wears and chafes off. It this matter is attended to, the laborious work of scraping may be largely eliminated. In the event that the varnish has been neglected and the unprotected wood has turned black, the only remedy is to remove the surface discoloration by scraping down to the bright wood underneath.

For this work a scraper of some kind will be needed, and the most convenient and satisfactory tool is that made by turning over one end of a flat file. Worn out files may be picked up at any machine shop, and the local blacksmith will forge, harden and grind the ends ready for use.

If much scraping is to be done, the amateur will do well to buy a can of paint and varnish remover, which will soften up the "shell" of the old varnish and thus considerably lighten the irksome labor of scraping. After the old varnish has been removed, the wood should be well sandpapered, cleaned free of dust and given at least three coats of good outside spar varnish, allowing each coat to dry for some twenty-four hours before applying the next. The work of varnishing is preferably done on a warm, bright day, and the varnish should be well brushed out to avoid "holidays," as the ship's painter calls the untouched spots.

As good painting depends so largely upon the size and condition of the brushes, the amateur should see that these are kept in good condition. If one is a bit fussy about the appearance of his boat and is not satisfied with anything short of a first-class job, by all means begin right by purchasing three or four first-class brushes. Although a good brush is more expensive as to first cost, it will outlast several of cheap grade, providing some little care is taken to keep the bristles in good shape. For occasional use three flat wall brushes and a couple of sash brushes will meet the amateur's needs. In selecting the large brushes, make it a point to pick out those with thickly set and long bristles. Gray, or white and gray mixed Russia bristles are much superior to the black China bristles, and a four, three, and two-inch size will be found most useful for boat work. A couple of oval sash brushes will be found convenient for cutting in small work and for interior painting. For varnishing the writer prefers a three or a three-and-a-half-inch paint brush, and when used for varnishing this tool should be kept for this one purpose. A cheaper brush may be used for applying the copper paint, but its use should be confined exclusively to its class of work.

To avoid the annoyance of shedding, the bristles of all new brushes should first be

"tightened" before they are put in use. The best way to do this is to separate the bristles and pour a teaspoonful of water on to the head of the handle and stand bristle end up until the water is absorbed by the dry wood. This will swell the head and tighten up the bristles without soaking the elasticity out of them, which is certain to happen if the bristles are soaked in water. Before commencing work, the few loose bristles should be worked out by dipping the brush in paint or varnish and drawing it several times across a rough, unplaned board. This will work out the few loose bristles which are too short to be caught by the ferrule.

For the benefit of the novice, it may be mentioned that there are two kinds of brushes. All brushes sold for paint and varnish are known as "cement set" and should not be used in shellac or alcohol. For the latter, use "rubber set" brushes. When not in use the bristles of all brushes should be immersed in linseed oil or water, but varnish brushes should be kept only in oil. When putting away for the season, brushes should be thoroughly cleaned and the paint and varnish washed out of the bristles with turpentine or kerosene. The brushes may then be safely stored away, with the assurance that they will be in prime condition for the next season's work.

Odds and ends of paint may be kept in condition by pouring about a quarter of an inch of oil on the top. Another way, which is perhaps the better method (owing to the oil becoming "fatty" upon standing for a considerable length of time) is to pour the paint into a can of suitable size, thus leaving but a very little air space. A covering of newspaper tied over the top will keep out the air, prevent the entrance of dust, and keep the paint from drying up.

The engine should be given a complete overhauling every season, and that the machinery of the boat may be thoroughly cleaned, examined and adjusted for possible wear, it is highly desirable to disassemble the entire motor. That this work may be done systematically and with the minimum of trouble, the boatman should procure a few boxes of various sizes to accommodate the different parts as they are taken down. If this plan is followed out, mixing up of the many different units will be done away with, and the labor of assembling will be considerably simplified.

There are always a number of minor repairs which of course should be made before painting.

To begin right, the engine should be first stripped of lubricator, water and fuel pipes and connections, carbureter, magneto, exhaust pipe connections, spark and throttle controls, and all lubricating pipes. As soon as one part is taken down it should be well cleaned with kerosene or gasoline, and this procedure should be taken to apply not only to the large but to the small parts, as bolts and nuts.

The cylinders, which are generally cast singly or in pairs in marine motors, may be lifted off the pistons by unscrewing the "holding down" bolts which fasten the cylinder flanges to the upper part of the crank case. In the case of a "one-man job" it will be found much easier to lift the cylinders and pull them off their pistons, than to uncouple the connecting rods and lift the whole mass of metal together. To avoid the possibility of bending or straining the connecting rods, the cylinders should be lifted off with the pistons at the lowest part of their travel and in a vertical position.

When the cylinders have been removed, the crankshafts will be exposed to view, and the pistons may be taken off by simply uncoupling at the crank or big ends. If the engine has been given ordinarily good care and has not suffered from lack of lubrication, the cylinder bore will be found smooth and polished the entire length of the piston travel. Clean out the old oil by soaking the cylinders in a bucket of kerosene. This treatment will also loosen up any carbon deposit that may have accumulated on the walls of the combustion chamber, and which is readily removed by a little careful scraping.

The pistons should next be given attention, and the rings should be examined to ascertain if they are gas-tight. If the rings are bright and smooth it may be taken for granted that they are in good shape, but in case black, sooty streaks are discovered across the face of the rings, these "blow marks" are a sure indication of leakage, and the worn rings should be replaced. Before removing the pistons and connecting rods from the crankshaft, the several pistons should be marked with a file or punch, that they may be assembled in their respective cylinders. The piston head and ring grooves should be cleaned out, and when removing the piston rings be sure to mark them that each may be put back in its proper groove. This little detail should not be overlooked, as the compression of the engine depends upon the fit of the piston, and if the piston rings are not properly assembled the compression of the engine will very probably suffer.

The gudgeon or piston pin should next be examined, and if slightly loose the set or anchoring screw should be tightened up to prevent the pin from coming adrift. Although most engine builders make use of a tapered pin or set-screw device for preventing the pin from working out, some engines are not so fitted. In the latter case, the piston pin must have a good tight fit in the bosses, and if it becomes loose through wear a new pin of the proper size will be necessary. In examining the piston pin for wear, look at that part fitting the bushing of the connecting-rod end. If the engine has seen much service a ridge will probably be found at either end and on the inside next to the piston bosses. This wear, which is due to the force of the explosion upon the piston, is largely confined to the lower side, and in cases of this kind it frequently happens that the bushing itself is more or less worn. This may be discovered by trying the fit of the pin in the bushing, and if too much play is evident (more than one sixty-fourth of an inch should not be allowed) a new bushing should be procured from the makers.

If there is too much play in the connecting-rod bearings the bolts which secure the two parts should be removed and a little metal filed from the flat surface of both cap and brass. Only a very little metal need be removed, however, and the brasses should be tried to fit by tightening up the bolts. If they fit snugly without binding the crank-pin, well and good, but if there is still too much play, file off a little more until a good fit is secured. If the bearing surfaces are kept clean and well supplied with oil the use of the scraper will not be necessary. In case the brasses are deeply scored, scraping is the only remedy, but as it requires considerable dexterity to work up a bearing to a smooth, snug fit, repairs of this sort are best turned over to a good mechanic.

In the event that there is an excess of end play in the main or crankshaft bearings (which looseness is generally made known by a knocking noise while the engine is running), the wear must be taken up. In most engines some provision is made for bearing wear by thin strips of metal, technically known as "shims." These strips are inserted between each bearing and when "tightening up" bearings it will probably be necessary to remove one or two of these shims from each side of the bearing. When one of these shims is taken out and the nuts tightened, the bearing naturally fits tighter on the shaft. For obvious reasons, the bearing should always fit snugly without play, but not tight enough to bind. It frequently occurs that the metal shims are too thick to obtain a good fit, in which case it will be necessary to substitute paper or card shims in place of the metal strips to secure the proper adjustment.

If the motor is of the four-cycle type, the inlet and exhaust valves will probably be more or less sooted up and need grinding in. Valve grinding is not a difficult task, although it requires a certain amount of labor and a little care. To properly grind in a valve, the first requisite is to select a suitable abrasive, which will cut away the carbonized deposit, yet not score or roughen the metal. If the valve and seat are in fairly good condition, a very fine grade of emery or carborundum will prove very satisfactory. However, if the valves have been neglected and badly hammered, with deep pock-marks in the metal, a more vigorous treatment must be resorted to. If in bad shape, the reader will save much grinding labor by first dressing off the bevel face of the valve with a flat, fine-cut file. This will smooth up and remove the deeper marks and put the valve in condition for grinding.

The grinding mixture may be either one of the several excellent abrasives put up in convenient paste form for this purpose, or the reader may use finely powdered ground glass, emery, carborundum or pumice, as preferred. The writer prefers fine emery or carborundum (known to the trade as 120), which cuts rapidly but leaves the metal very smooth and nicely polished. If emery is used, a very little of the abrasive should be put in a saucer or clean tin cover and wet up with a little kerosene to make a thinnish kind of paste. To prevent running, a few drops of heavy lubricating oil

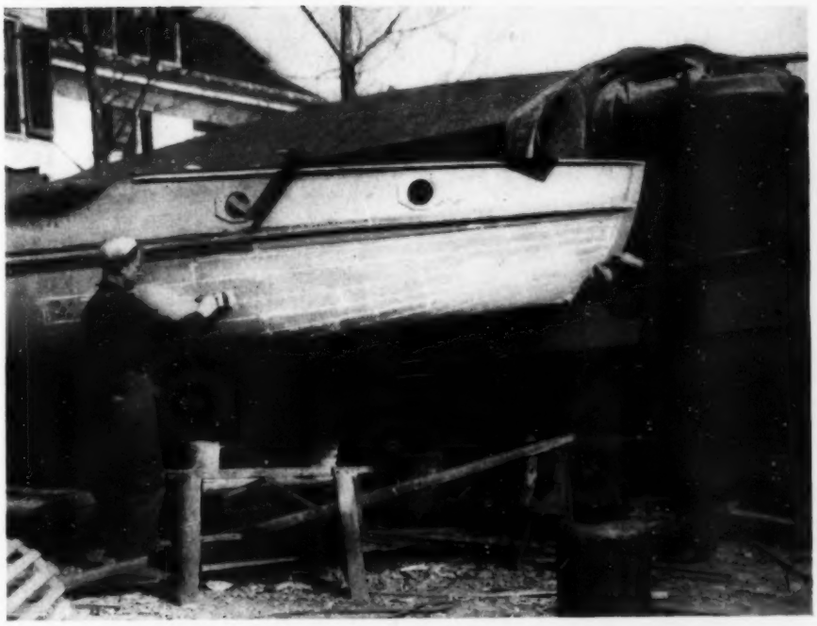
may be added to give the grinding mixture more body. Before grinding it is a good plan to stop up the valve port leading to the cylinder with a wad of waste, and thus prevent the possibility of the emery from falling into the cylinder and injuring the piston and bore.

This precaution taken, smear a little of the mixture on the bevel face of the valve and also on its seat. Grinding is easily accomplished by inserting the blade of a screwdriver in the slot cut in the valve head, and rotating the handle between the palms of the hands. It is not necessary to press upon the tool, and that a smooth grinding job may be secured only enough force required to rotate the valve should be used. To prevent "balling up" of the grinding medium, the valve should be rotated a few times in one position, then lifted up and partly turned around and rotated as before. This alternate lifting up and grinding will do away with any liability of scratching and the valve will be uniformly ground on its whole surface. The grinding mixture should be renewed as the work proceeds, but the "new hand" should bear in mind that a little of the mixture will grind more quickly and smoothly than a liberal quantity. The grinding should be continued until the face of the valve has the appearance of a bright ring of metal across the entire circumference of the face and seat, and the metal should be smooth and polished. After grinding, the waste may be withdrawn and the valve and seat wiped out with gasolene.

The reverse gear should also be given attention. If of the gear and clutch type, the brake band and clutch are generally enclosed and work in a bath of oil, and providing it is well lubricated and not used too roughly, it should need very little attention beyond a thorough cleaning. In other designs, the gears are contained within an oil-tight casing, but the brake band is lubricated by means of a separate grease cup. As friction means loss of motor power, the reversing device should be kept clean and supplied with the proper quantity of oil. The brake band should be kept clear of the drum, and in case of wear in either band or clutch, the lost motion should be taken up by adjusting the levers to take up the wear.

The steering gear is a very important unit of the boat and should not be overlooked when putting the craft into commission. Attention should be particularly directed to the communicating gear and condition of the tiller lines or cable. If worn, it is best to err on the side of safety, and a new length should be spliced in as needed. To avoid undue slackness it is a good plan to splice in a small turnbuckle, by means of which the tension of the cable may be readily adjusted.

There are, of course, many other important points which demand consideration, but the main ones have been covered, and the reader's boating experience should supply the omissions. If the work of overhauling and outfitting be done systematically and thoroughly, the boat will be in prime condition for its season afloat, and deterioration and depreciation will be reduced to the minimum.



All seams and nail holes should be puttied before the paint is applied.

The Question of Draft.

A Plea for Greater Deadrise in the Design of Motor Boats to be Used for Cruising. Both Seaworthiness and Stability are Dependent upon This Point.

By Allan O. Goold.

As our eyes follow down the list of "boats for sale," we almost always see somewhere in the description accompanying the offer of a cruising craft some such statement as "wonderful sea boat," "very seaworthy model," or "unusual seagoing qualities." Of course a good salesman will seldom ascribe any but desirable qualities to the wares he is attempting to dispose of, and owners of cruising motor boats will not easily admit that theirs are not real heavy weather craft of the sturdiest and briniest type. Nevertheless the photographs which show the "wonderful sea boat" or the "very seaworthy model" are sometimes such as would scarcely recommend the ship for a long outside run, perhaps showing the low heavy quarters and broad stern of the speed type combined with a sharp entrance which destroys the symmetry of the waterline plan. If you read the description which follows, as most of us are pretty likely to do, you may find among the craft's dimensions the words "draught to rabbet 10 inches." That means that the brave and sturdy ship before you has below her waterline just 10 inches of real boat, the remainder of her "3 feet extreme draft" being made up of keel, deadwood and skeg. Such a model cannot well fail to be a "rooter" and very uneasy in a sea way. The fact that she has liberal freeboard forward and a small watertight cockpit are her only just claims to seaworthy qualities.

These high top sides which are happily so fashionable just now are useful in giving head room in the living quarters and serve to throw off much spray that would otherwise sweep over the vessel much to the discomfort of her occupants. The whaleboat, or compromise stern type in particular, are hard to improve upon above the waterline.

But under water it seems to me the motor cruiser has not progressed as rapidly as in the perfecting of the outboard profile and accommodation plan. I do not mean by this that the modern cruiser is carelessly or crudely modelled below the water. On the contrary it seems that the later cruisers must develop nearly the maximum speed possible, displacement and power considered. But after all is speed the ultimate aim of the designer of cruising craft?

Possibly the average designer reasons something like this: "Jones wants a cruiser of general summer sailing on the sound. He is new at the game and if the weather really looked bad he would stick to his moorings or anchor under some lea. Moreover he has friends in his club who have speedy cruisers designed by ——— and I think he will be pleased if I design him a boat that will 'trim' them. Of course the new boat will be dry enough in any ordinary weather with her liberal freeboard and *real* seaworthiness will never be required."

So the boat is built 35 feet in length with a draft of ten inches at the rabbet and makes a speed of 9½ miles with a 12 h.p. heavy duty motor. When Jones sees that his boat is heavily and strongly built, has high sides and no way for the water to get below decks, he feels that she is thoroughly seaworthy, and the fact that he can beat his friends a quarter of a mile an hour is sufficient proof that his designer is the one real designer in the country.

Now, as a matter of fact, that gentleman may be a master of his calling and still in this case have come a long way from turning out a perfect sea boat. Should another client ask him to design a boat in which to cross the Atlantic single-handed, the resulting model would doubtless be in striking contrast to that of the "seaworthy cruiser" which we are discussing.

Every competent designer will tell you that seaworthiness is to a great extent dependent upon symmetry of form. The two sides of the model are alike as a matter of course. The bow and stern should not vary too radically in form or displacement. Why then should we rear a structure above the water having a hight of five feet or thereabouts and below the water be satisfied with a paltry ten inches of actual boat? Deadwoods of course do not count in such comparisons.

In racing craft we limit the draft, we limit the beam and, quite consistently, we limit the freeboard to correspond. But in our cruisers we give liberal beam, abnormal freeboard and then reduce the draft to barely sufficient to to float the hull at its designed waterline. If possible we eliminate every pound of the bal-

last which properly should be well down under water to counteract the weight of the towering topsides. And we do this solely and entirely for the sake of a mile an hour more speed in smooth water. In rough water a foot of extra draft would doubtless gain for you a mile an hour over the shallower model. And bear in mind that in many localities the water is quite as often rough as it is smooth.

I do not intend to advocate excessive draft, twenty-four inches to the rabbet should suffice for a thirty-five footer. True it would require some ballast to bring the boat down to her lines and I contend that she would be in every way better for it. I am sure that she would have a less violent motion in a seaway, that she would steer better, forge through a head sea faster and more steadily, throwing little water and pounding scarcely at all.

Last summer I saw a so-called seagoing craft jumping clear out of the water when driven against a steep head sea, with sheets of spray flying six feet above the rail at every impact. The day was windy but not tempestuous. However long the hull might resist such a pounding, I am certain that the crew would be exhausted in a very few hours. This boat has liberal beam but very little draft and is a good type of her designer's creations. She is fast, exceptionally well built and a very handsome vessel, and at her moorings she looks capable of going anywhere in any weather.

This designer naturally values his reputation for building speedy cruising craft, but he would certainly give his client a deeper hull if that client demanded it, even though the boat would not drive quite as easily.

The remedy then, is in the hands of the individual owner. Tell your designer that you desire a real ship. That you will be satisfied with eight miles an hour, provided you can keep it up, 'blow high or blow low." Tell him that you want your boat to be in her element just at the time the "fair weather fleet" is turning back to hunt up a harbor. Any boat is good enough in a calm. Have *your* boat good in a blow—never mind her performance under any other weather conditions.

In closing I ask you to look up Sepoy and see if a study of this magnificent craft does not implant in your mind a resolve to follow her lead in miniature, when next the "disease" reaches its critical stage and demands for you the only really efficacious remedy—a new boat.

Calking and Smoothing the Motor Boat

The Importance of These Operations and the Methods Usually Employed. Suggestions of Value to the Man Who Overhauls His Own Boat.

By Gerald T. White.

FEW people realize the importance of the fact that the man who does the calking has more real responsibility on his shoulders than the men who do any other part of the building of the boat. Any boat will float if it is well calked, but the best hull that can be built is useless unless the calker knows his business.

After a boat is planked, the ouside is necessarily rough, and as soon as the last plank is fastened in place, the boat builders sharpen up their jackplanes and begin to plane off the hull. They plane lengthwise, and after every few strokes the palm of the hand is run across the spot planed to feel if there are any ridges in the plank. In this way the hull is made fairly smooth. After the boat is "jacked" it is calked. To calk, and calk properly, takes not only a great deal of skill, but also a lot of strength, for it is no easy matter to keep a heavy calking mallet swinging with one hand, while the other is holding the calking iron and feeding the cotton into the seam.

One of the mistakes most frequently made by inexperienced calkers is that they drive the cotton in too hard, with the result that the plank splits out on the inside, causing a place that will always leak, unless a new piece of plank is put in, or a block carefully fitted on the inside, over the split and well fastened.

Motor boats are nearly all calked with what is known as calking or spun cotton. This is very much like cotton batting, except it comes in skeins instead of sheets. These skeins can be split up in long lengths of the right thickness, and rolled in a ball so that they can be used handily and economically.

On boats with tight seams lamp wick is often rolled in with a calking wheel.

This calking cotton is used for calking all seams in both planks and decks. The cotton is light, fairly easy to handle, and when properly used will effectually close all seams.

The cotton is usually hammered into the seam with an ordinary calking iron and mallet, but sometimes on light boats the cotton is rolled into the seam with a calking wheel. This is a quicker method than the regular iron and mallet system, but cannot be used on thick planking because enough pressure cannot be brought on the wheel to force the cotton far enough into the seam, but on the planking ⅜ in. or ½ in. thick the wheel will do very well.

On boats that have very tight seams, ordinary lamp wick is often used in place of calking cotton. This is almost invariably rolled into the seam with a wheel. It can be rolled easier than the regular calking cotton, but it is not advisable to use it on planking more than ½ in. thick unless the seams are exceptionally tight, tighter in fact, than most boats built in regular boat shops.

Where the seams are very tight on the outside it is necessary to open them up so that the calking material can be inserted. This can be done with an iron resembling an ordinary calking iron, except that it is ground wedge-shaped so as to force the seam open. The seam is opened with this whenever it is tight. Very often the apprentices in boat shops do this, while the boat builder will follow up and calk as fast as the seam is opened.

Another kind of opener can be made out of a piece of hard wood about 4 in. long—a broom handle is excellent. This piece is sawed through diagonally at a point about ¾ in. from one end, and sawed nearly through. The piece is then turned over and a cut made directly opposite the first one, and stopped about 1/16 of an inch from the other cut, the wood is split out, leaving a thin blade 1/16th in. thick; this blade is cut to a sharp edge and inserted in the seam so that the diagonal part is against the plank, and it is then hammered sideways along the seam, opening it as it goes along. Care should be taken that the opener does not "jump the track" and start a seam of its own along the grain of the plank.

On the larger sized boats of from 80 feet up, oakum is usually used for calking.

Oakum is prepared from old tarred hemp rope, which is picked apart into fine strands. This operation is often performed by prisoners in a great many of the penal institutions. After being picked apart the oakum is compressed into bales and shipped.

In Europe some of the larger vessels are

calked with a variety of sea weed very much like moss in texture. This is hammered into the seams in the same manner as cotton.

The caulking material must be forced into the seams so hard that two men are required in large yacht and ship work, one to hold the caulking iron, on which there is a long handle, and another to swing a heavy mallet called a beetle.

In caulking old boats it is of course necessary to remove all the old caulking material from the seam before the new is put in. On small boats this can usually be done by hand with a small flat hook, called a reefing hook. Where the seams are small, a blade of an old knife will be found to answer the purpose. On the larger boats it is necessary to use what is called a reefing iron. This iron has a beveled edge and when inserted in the seam and hammered with a diagonal stroke, will clean the seam of all the old material.

In caulking old boats more care must be taken, as the planking is often split in places and contains soft spots caused by rot, so that the cotton will break through the seam if not use with great care.

If your boat leaked last season, ascertain where the leaky seams are, and remove the cotton. It is very seldom that a boat has to be re-caulked above the water line, as if properly done in the first place, the caulking above the water line should last as long as the hull.

The next operation after calking is known as smoothing off, and is done with a small wooden plane, called a smoothing plane. The procedure is the same as in jack planing, except that it is done more carefully and only a thin shaving is taken off. After the "smooth off" the hull should be free from anything but the slightest roughness, which can be sandpapered out.

In boats that are to be finished bright, that is, varnished, or on boats on which special stress is laid on the smoothness of the outside surface, such as speed boats, which must be perfectly smooth so as to reduce the skin friction to a minimum, there is a third operation in the smoothing. This is done with an ordinary cabinet scraper. The scraping is done diagonally across the plank, and as a result the very small ridges which cannot even be seen are removed. By this time the hull has what could almost be called a polish, but there is still the sand-papering to come.

Most hulls are painted so that it does not matter if the grain of the wood is scratched. For that reason hulls to be painted are sandpapered crosswise of the plank, first with coarse sandpaper and later with a finer grade. After being rubbed with the fine paper the hull is ready for the first coat of paint.

A practice which is gaining favor more and more each year is that of thoroughly wetting the hull after the boat is caulked and planed and before it has been touched with sandpaper. The hull is well sponged with warm water, but must be perfectly dry before it can be touched with sand-paper, which will take several hours. The water swells the planks and causes all the bruises and scratches to swell out even with the surface of the plank. It will surprise one to see how much a plank will swell when soaked; seams which were open 1/8 in. will often swell perfectly tight.

On boats that are to be varnished on the outside the treatment given them after they have been planed differs slightly from that given painted boats, as all operations must be done with the grain, so as to preserve the beauty of the wood. The scraping is done the length of the plank, instead of across the plank, and the sand-papering is done in the same manner. It is much harder to get the lumps out in this way and therefore it takes much longer to smooth a bright finished boat and consequently the cost is greater.

There are now on the market several portable sand-papering machines which are driven by either compressed air or an electric motor. These machines will prove invaluable in the boat shop where there is much sand-papering to be done, but the amateurs will probably always use the old fashioned elbow grease method, which will give just as good satisfaction, although it does take longer than the machine work.

On the larger boats oakum is generally used for deck seams as well as planking.

On hulls that have been used for several seasons it is often necessary to smooth off the rough places that have been caused by soft spots in the wood swelling out, and also by dents due to accidents or careless handling.

It is often more difficult to smooth off an old boat than a new one, as there are liable to be nails that have worked out flush with the surface of the plank, which will ruin the edge of the plane.

In smoothing old hulls it is advisable to remove all the paint or varnish before an attempt is made to use a cutting tool. There are three ways in which paint or varnish can be removed. First, by burning off the paint with a painter's gasoline torch, which blisters the paint so that it can easily be removed by a scraper or even with a putty knife. In the hands of some one used to the vagaries of the gasoline torch this is a very good method, but amateurs should use great care in handling a torch.

The second method is to use some of the chemical paint or varnish removers, which are simply applied to the surface with a brush and after a short while soften the paint or varnish so that it can easily be scraped off with either a three-cornered boat scraper, or an ordinary cabinet scraper. The cost of the chemical remover is not enough to make much difference to the average boat owner, as it will not be used more than once a year, and probably not that often.

The third method is to scrape the paint or varnish off with sharp scrapers. This is hard, tedious work and is not to be recommended unless it is absolutely impossible to obtain either a gasoline torch or some chemical remover. If the scrapers are kept sharp, and the workman has lots of patience and strength a job equal to the other methods is possible.

After the paint or varnish is all off, exposing the rough spots, and there are sure to be some, especially along the seams, which usually are found to have loosened with the vibration of the engine so that the plank edges are plainly felt when the palm of the hand is run across them, then it is advisable to smooth off the hull before the fresh coat is put on. While this means some extra labor it will well repay the boat owner, as the boat can be made to look almost like new. An ordinary smoothing plane is the best tool to do this work with, but care should be taken that there are no fastenings near the surface to spoil the edge of the plane. If any fastenings are found, circles should be drawn around them with a piece of chalk and these spots should be studiously avoided when planing.

After the hull is all planed the marked spots should be gone over with a scraper, and then nail or screw should be filed down flush with the surface.

The hull should now be sand-papered in the same way that a new hull is treated and will amply repay anyone for the extra trouble.

If the amateur should wish to caulk his boat, the best way would be for him to visit some boat building shop and spend an afternoon watching the caulkers at work. If possible try to persuade one of the men to let you use the caulking tools, as in that way a novice can gain more knowledge about caulking that he would be reading a library of books on the subject, and he will soon see that caulking is an art and not simply an operation, and it may bring to him the realization that a little credit should go to the humble boat builder, and not all the laurels to the clean-collared, highly-paid men in the designing office.

Government Inspection of Motor Boats.

Conditions as They now Exist and Disadvantages of the Present System. Suggestions for a Better Classification of all Power Craft.

*By Capt. Ira Harris, U. S. Supervising Inspector, Second District.**

IN so small a space I cannot touch on the discrimination against steam in the regulation of fishing and towing vessels, nor talk of the present requirements of passenger and pleasure motor boats, but I shall discuss the following questions:

"Should the Steamboat Inspection Service be extended to regulate motor boats? If so, which classes of motor boats should come under Government supervision, and to what extent?"

When the Department of Commerce and Labor was created, the Steamboat Inspection Service and the office of the Commissioner of Navigation were transferred from the Treasury Department. At that time there were no motor boats, and so there were no provisions made for them in the transfer of duties and jurisdiction. The measurement, registry and enrollment of all vessels remains in the hands of Treasury officials. In this district, the Collector of Customs has in 1907 and 1908 authorized the employment, by the Surveyor, of a steamer to patrol the waters about New York, with a number of officials to examine motor boats as to their equipments and papers. In other districts, Philadelphia, for instance, the Custom officials have taken no hand in regulating motor boat navigation. The result of this doubtful, or divided, responsibility is apparent in the lack of uniformity.

I observe that in the waters around Providence, about 9 out of 10 motor boats carry proper lights; in those around New York about half carry them, and around Philadelphia not more than one in ten have side lights.

The measurement for tonnage is under the supervision of the Commission of Navigation, and the work is done by an officer of the Custom Service. If all the officers who measure vessels were as honest, capable and fair-minded as those in New York, there would be no reason for changing the base of classification from tonnage to length, but you will readily see that tonnage rules applied to small craft of such varied forms and construction, lack uniformity, and are too complicated and uncertain. Our present law divides motor passenger and freight vessels on the 15 ton line, and many are built to be just under 16 tons, so as to avoid inspection. In consequence we see a motor vessel of less than 15 tons carrying 200 passengers, and a steamer of twice that tonnage allowed to carry only half as many.

I have known a motor boat to run about the coast looking for an inspector who could be persuaded to measure her under 16 tons, when she was obviously much larger. On the other hand, if the line was drawn at, say 40 foot lengths, a man building a motor boat would know exactly what requirements applied to his boat.

But this point does not interest many yachtsmen, and should anyone want information on this point, I would be glad to have him write or call at my office.

The main argument against placing the responsibility of motor boat regulation in the hands of the Steamboat Inspection Service, is the inadequacy of the present force for the increased work, but as no one now does this work, of course additional force must be provided in any case, and the men who inspect steamers are the proper men to inspect motor vessels.

But should motor vessels be inspected? I see no reason for making any distinction between motor boats and steamboats of the same sizes and doing the same work. I do not believe that small motor boats should be inspected, but neither do I believe that small steamboats should be inspected. A few weeks ago a small steam launch was bought from the navy, inspected in New York, and sent South to be the tender of a motor yacht. The yacht is not inspected and carries no licensed officers, but her launch is inspected and must have a licensed pilot and a licensed engineer. Every one will see the inconsistency in that case.

But some yachtsmen will argue that commercial boats only should come under Government regulation. Let us look at that point for a moment. If I asked you about the number of pleasure motor boats there are in New York waters as compared with the number of those carrying passengers for hire, some would answer, ten pleasure boats to one carrying passengers for hire; some would say 20, and some even 50. Suppose we say 15 for pleasure to one for hire? Up to January 1st there were 2,940 men licensed to operate motor passenger vessels of 15 tons or less. That, at 15 to 1, would make more than 40,000 pleasure motor boats around New York. Could the 3,000 be subjected to Government regulation when navigating among 40,000 exempt? I hardly think so. I think it would be much wiser to have all a certain length, say 35 feet, as specified in the Goulden bill, inspected, and all under the length exempt. I suppose that no more than 5 per cent of New York pleasure motor boats are more than 35 feet long, but if you wish, make the length limit 40 feet, or even 50 feet ,but whatever it be, inspect all above it, whether pleasure, or towing, or fishing, or freight, and all carrying passengers for hire no matter what their size.

In this connection I want to correct an impression which many have; that the large motor yachts are operated in a less dangerous manner than the little ones. I used to think that was so, but my experience is that the most dangerous vessel in our waters is the motor yacht so large that the owner hires a master. As no license is required on motor yachts, men who cannot get a license seek employment on them.. Those motor boat masters who have been before me in collision cases certainly are, on the average, inferior in many respects to masters of steam yachts of the same size.

Some professional motor boat officers are purposely reckless. As an example; the Corinthian Yacht Club has its entrance between long, high piers. The Hupa, coming out from between those piers, collided with the Nellie coming down the Delaware. The Hupa is a tender of the motor yacht Savanarola, and is herself a racing motor boat, claiming a speed of 23 miles. She was handled by the master and chief engineer of the Savanarola. The Hupa started at an 8 knot speed, and was probably going 18 by the time she reached the Nellie.

When asked, "Don't you think it is a safe practice for a vessel to come out of a dock at the speed that the Hupa came out on the 15th instant?" the chief engineer replied, "No, I don't." When the captain was asked, "Do you consider your action in allowing the motor boat Hupa to proceed out of the basin of the Corinthian Yacht Club at the speed she did, jeopardized the lives of the persons on board the motor boat Nellie?" he replied, "I don't, if they had been in their proper place."

He explained that he knew the Nellie was navigating what the law said was the proper waters—the starboard side of the channel, but that in order to avoid boats run as the Hupa was, the proper place for other vessels to navigate was not in the starboard side of the channel but in the middle. He did not blow any leaving whistle as required by law, and said, "It is not the custom to use any signal on motor boats in entering or leaving private club basins or docks."

In the decision in that case, the local inspectors of the district of Philadelphia say in part as follows: * * * It is the opinion of this board that the unlicensed persons in charge of the motor boat Hupa were primarily responsible for this collision, and that their acts jeopardized not only their own lives but the lives of the sixteen persons on the motor passenger vessel Nellie. In view of the high speed of the motor boat Hupa, had that vessel struck the Nellie amidships she would have cut her in two; and, there being eight ladies aboard of the Nellie, they probably would have been drowned if they had escaped being killed outright.

We further consider that boats of the type of the Hupa when operated on navigable waters of the United States are a most dangerous menace to persons traveling on vessels regularly inspected and in charge of persons licensed by this Service.

As the two persons who were in charge of the motor boat Hupa are not required to hold licenses, this board has no jurisdiction over their acts.

If one of you had been taking his family or friends in his motor boat in the place of the Nellie, what would you think of the claims of the Hupa's captain, that "we yachtsmen don't have to obey the rules of the road, and common boats must keep out of our way?" Let me tell you that true yachtsmen want to live up to the law. They don't want exemptions, or class privileges. They want to play the game according to the rules, and want everyone else to do the same.

Motor boat running is very much like automobiling—a man gets a runabout, and then, in a year or so, a regular car, and then a racing machine. You start with a small power boat, then you get a bigger and faster one, and, as soon as you can afford it, you want a motor yacht. The racing fever gets into your blood, and you take big chances. Some motor boats are built on lines that are positively criminal. The boat builder thinks of nothing but speed, and doesn't know how to combine speed and safety.

Really, no one should be allowed to operate a motor boat without knowing something about it. My idea is this: a law should be made requiring all motor boats above a certain length to be inspected, and all under that length to be numbered, registered, and the owner licensed in the office of the local inspectors of steamboats, just as automobles are numbered, registered and the owner or chauffeur licensed.

The boat would need nothing except her number, beyond what is now required; the owner would have to show that he knew the rules of the road. Such regulation would not entail any expense, and but very little trouble. It appears to me that it would make the navigation of our waters safer.

One more suggestion. Until we have regulation by law, would it not be well for yacht clubs to require applicants for membership to demonstrate that they know the simpler rules and that their boats were properly equipped?

**The above paper was delivered by Capt. Harris at the recent annual dinner of the New York Motor Boat Club.*

A Substitute for Gasoline.

A Recent Invention for the Production of an Efficient Gas from Crude Oil. Description of the Hydrocarbon Converter and Results Obtained from its Use.

WHEN one stops to consider the vast increase in the use of gasoline engines during the past few years one begins to wonder just how long the fuel supply will last, whether it can keep pace with this phenomenal increase and if not will not the price of gasoline in time become prohibitive? An authority in the oil trade was recently responsible for the statement that if every oil refinery in the United States were to shut down upon a given day, every gasoline engine in the country would cease running almost immediately for lack of fuel, so close does the demand keep pace wth the supply. Such oils as kerosene and the heavier fuel oils could, however, still be had for many months before the stock on hand would become exhaust, since the demand for these oils in much more limited.

The method of refining crude oil as it comes from the wells in the form of a greenish brown fluid is a simple one but very important. The crude oil is placed in large tanks, called stills, where it is subjected to heat and at the lower temperatures its most volatile contents, such as gasoline, naphtha, benzine, etc., pass off while at higher temperatures the less volatile kerosene is given off. These products constitute approximately one-third of the oil and the residue, which is known as fuel oil, is today almost a drug upon the market, since its use commercially is so limited.

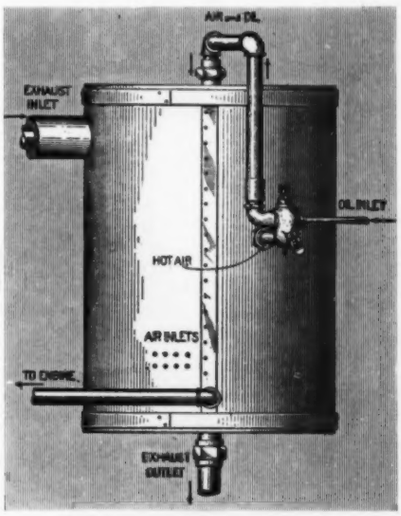
For a number of years, and especially since the perfection of the gasoline engine, men of inventive genius have turned their attention toward methods for gasifying oil as has been done with coal, but without any practical success of a commercial value, except in the methods employed in the production of oil gas, which is used in railway lighting and to some extent in small towns. This method, however, requires the erection of a large plant and it is necessary as well to provide for the disposal of the tarry residue from the oil which cannot by this means be gasified.

Kerosene has long been the principal product of the oil refinery and until the extensive use of the gas engine, gasoline was merely a by-product for which there was no extensive demand. With the coming of the internal combustion engine, however, the demand for gasoline increased at an astonishing rate and it has until recently been the only acceptable fuel for these engines. The rapid evaporation of gasoline into gaseous vapor at a relatively low temperature makes it especially desirable for mixture with air, forming a readily explosive combination within the cylinder without carbon deposits. The other fractions of crude oil, such as kerosene and the heavier hydrocarbons, can be utilized only in the form of a spray or liquid vapor which very soon forms tarry deposits in the cylinders, quickly clogging the working parts and reducing the power until the engine is finally useless.

A recent invention, the hydrocarbon converter, has been perfected especially for use upon motor boats and is the embodiment of a novel oil gas making process in a most simple and easily adoptable form. The machine itself consists of a nest of three cast-iron cylinders, one within another, thus making three compartments which are installed in connection with the engine, somewhat similar to the manner in which a carbureter is installed, the exhaust pipe from the motor being connected to the middle compartment, through which the hot waste gases circulate and find an outlet through a continuation of the exhaust pipe on the other side. The inner and outer compartments become highly heated by radiation from the inner compartment.

This inner compartment contains a channel nest of cylinders of crucible material minutely porous in character which quickly absorbs and retains the high temperature communicated to it. Air is introduced through openings into the outer chamber where it also is highly heated and then passes out through a pipe which unites with another pipe from the oil supply tank. A mingled stream of oil and air is then drawn into the inner compartment by the suction of the engine. The oil is gasified in passing through the channels of the hot porous cylinders of the inner compartment and the final product is an airified hydrocarbon gas of high temperature which is delivered to the engine by a pipe passing from the center of the inner compartment. The heat of inner compartment is supplemented by slow and more or less incomplete combustion of some of the constitutents of the oil and the oxygen of the air, resulting principally in the formation of carbon monoxide which maintains a considerably higher temperature in the porous cylinders than that of the engine exhaust gases.

The complete gasification of any oil appears to be dependent upon the division of its mass into most minute fractions and their subsequent submission in that state to high temperatures. Most of the methods heretofore in use have been mechanical, producing a spray of liquid vapor, but unless the required amount of heat penetrates to the center of each globule so formed so that its action is uniformly effective throughout, only the more volatile contents will gasify and the heavier carbon compounds will remain unchanged. The action of this hydrocarbon converter is due to the fact that the hot porous cylinders absorb the oil and within the pores of the cylinder the oil is divided into such microscopic particles that it very nearly approaches a true molecular distribution. In such an extremely fine state of division and with each minute particle surrounded by the hot porous walls, the applied heat penetrates so evenly and effectively that each globule undergoes the necessary chemical transformation and the change to a gas is effectively completed.



The hydrocarbon converter.

The converter in question is controlled by the Hydrocarbon Converter Company, of New York City, and for the purpose of demonstrating the efficiency of the lower grades of oil when used in connection with the converter, as compared with gasoline as a fuel, a test was made upon the yacht Wayward, a vessel 78 feet in length, having a draft of nine feet and an engine with a rated horsepower of seventy. The test was made over a marked course from a point in the Upper Bay to a point on the Hudson River opposite Sing Sing and return, the first day with gasoline as a fuel and the next day with fuel oil, in connection with the converter. Experts were aboard the yacht and kept accurate record of her performance at all times. The following is the official report of the test:

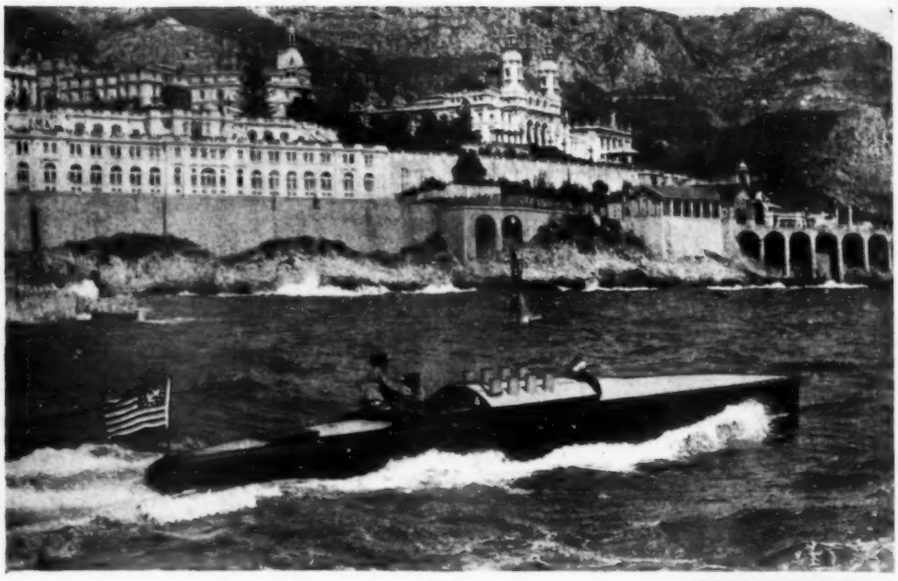
		With Gasoline	With Crude Oil
Date of test	1909	Sept. 14	Sept. 13
Distance over course	miles	80	80
Condition of weather and tide		same	same
Time of run	hours	8	7 5-6
Fuel used	gals.	97	40
Fuel per hour	gals.	12.125	5
Fuel per R.H.P. hour	pints	1.39	0.57
Cost per gal.	$	0.14	0.03
Cost of fuel per hour	$	1.697	0.15
Cost of fuel per R.H.P. hour	$	0.024	0.002
Cost of fuel per run	$	13.58	1.20

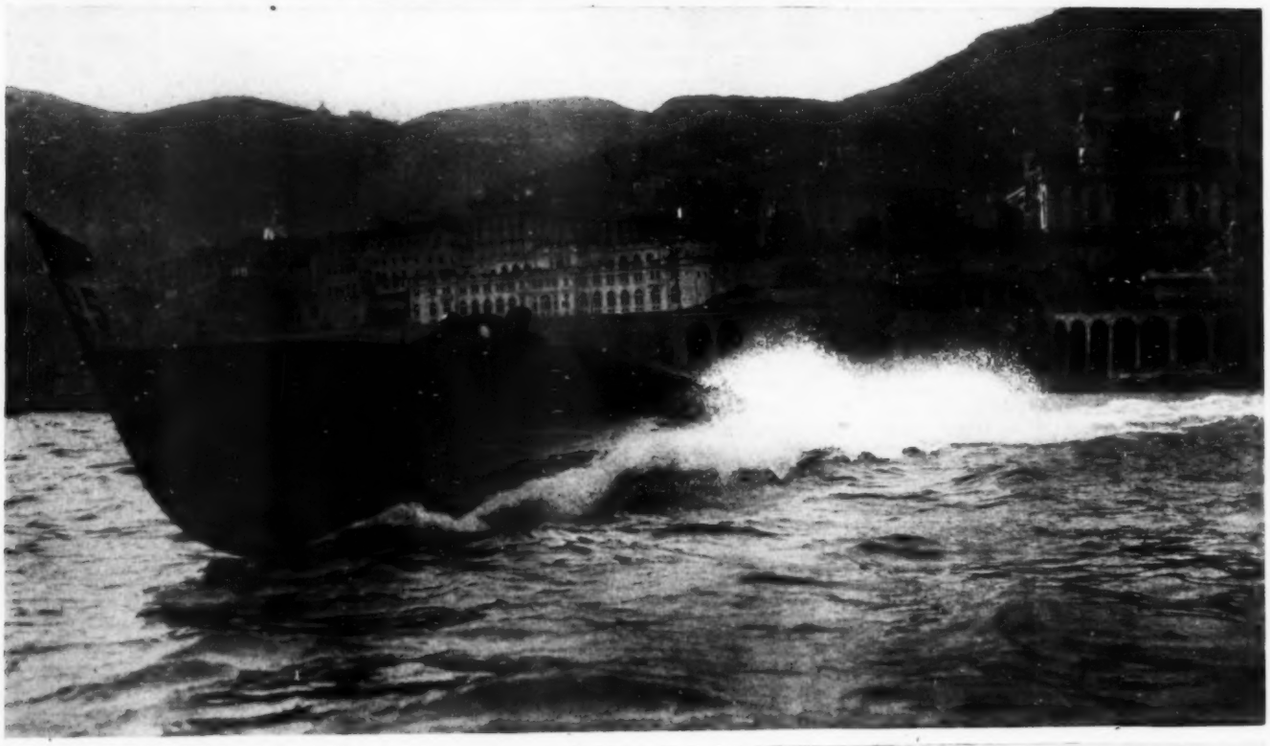
ECONOMY OF HYDROCARBON CONVERTER.

Saving for run.....$12.38
Saving per hour..... 1.54

Although the cost of fuel varies greatly with the locality in which it is purchased, the same is true of all the distillates of oil, but there is always wide difference in the market prices of gasoline, kerosene and the crude or fuel oil. The New York markets may be taken as an indication of the relative differences, gasoline costing approximately 14c. per gallon, kerosene 7c. and fuel oil 3c. In Europe the price is considerably higher for gasoline and in more remote parts the price is so high as to make its use practically prohibitive.

Wayward, the 78-foot motor yacht upon which the tests were conducted.





Photographs by Edwin Levick

Three of the principal performers in last season's races at Monaco. In center; the British Wolseley-Siddeley, the six hundred horse-power winner of the Grand Prix International in 1:55:3-5. Above, Dixie II, twice the winner of the British International, and below Panhard Levassor, winner of the previous year's meet. The races this year will be held April 1-14 for prizes aggregating $24,000 in value.

Locating Trouble by Sound.

The Language of the Gasoline Motor. How It Makes Its Ailments Known to the Man Who Understands. The Various Squeaks and Knocks and What They Indicate.

By Walter J. Forbes.

WHEN endeavoring to persuade a prospective purchaser to leave his cash with me in exchange for a motor, the remark is often made, "I suppose that with this motor I won't be left out in the Bay some day and have to be towed home?" My answer is that "You very probably will, unless you make a close study of your motor before attempting its operation."

Learn to know the whys and wherefores of each part, so that should trouble occur you will be able to locate it by a close inspection and to find which part is failing to perform its proper duty.

Yes, the motor can talk, too, and does so right to the point, and if its operator does not give heed to its complaints and supply the necessary medicine, the penalty is a more or less serious break down.

Note carefully the sounds or music of the motor, and when a discord arises and things are out of rhythm find out what member of the orchestra is causing the disturbance and see that he tunes up at once.

Many of these discords sound the same on all motors, and once learned can be located at once. For instance, a loose flywheel has a deep rythmic pound which may be slight at first but gradually increases until you wonder how it was you were able at one time to talk across the motor to your friends without using a megaphone.

I have known boat owners to fuss around for weeks trying to find out what caused that jar in their boat, and although told to inspect the flywheel fastening, they felt so sure the trouble could not be there, that only as a last resort would they consent to try and see if a little tightening could make a difference, when, Presto! the music was all in accord again. This difficulty occurs mostly where the flywheel is keyed on to the shaft, but could also happen where it is bolted to a flange, and the bolts, through carelessness, be a loose fit in the bolt holes. The pounding comes from the alternate driving ahead of the shaft against the key or holding bolts, on the outward stroke of the piston, and the following up of the flywheel on the other side in driving the piston back on its return stroke.

Another sound, which is somewhat like a flywheel pound, is caused by pre-ignition, which, however, causes a sharper and more metallic clank, rather more noticeable in four-cycle motors than in those of the two-stroke type. Too great a spark advance of the timer is a common cause of this, or it may be caused by an overheated spark plug or point, a particle of carbon in the cylinder getting hot, stoppage of the circulating water causing the whole engine to heat, or possibly a defective timer. In any case, get after the trouble at once; fix it or the result will surely be a big engine doctor's bill, and, incidentally, a kick over the cost.

At times a stoppage of water circulation becomes so serious as to wreck an engine, should the operator lose his head; for instance, a natural thing to do would be to pull the clutch when the motor is noticed to be laboring and then to turn to pull the switch when the speed increases at a jump. The chances are then that the engine will continue right on going and run up into the thousands of revolutions per minute. Keep your wits and put a load on by sending home the clutch, either in the go-ahead or reverse, shut off the gasoline and close the throttle.

A squeak is sometimes very difficult to locate, as the sound is carried to all parts of the engine. I had a case where a customer, after searching for a long time, finally located the trouble in a loose propellor; it was just slipping enough to cause a good healthy squeal and it seemed to be right in the engine.

Another squeak might come from a loose bolt, and right here let me advise that all bolts and nuts be gone over regularly with a wrench and set up where needed, but be careful and do not overturn them. Should you have a stubborn one which will not remain tight, take it out, clean the threads thoroughly, both inside and out, oil well with thin oil and replace. You will then be able to take it up much tighter than before. Dry threads of bolts and nuts will cut one another and cannot be set up to a proper fit.

To properly set up these bolts and nuts, it is of first importance to have a good, serviceable wrench, preferably a solid steel spanner, made to fit. If these are not supplied by the engine builder, go to some reliable hardware dealer who makes a specialty of mechanics' tools. Another type of wrench which is also extremely useful in many cases is a T-handle socket wrench, with which it is possible to get into places hard to reach with the ordinary spanner. There are also in the market adjustable-jaw S wrenches which are very handy, but again in getting these see that you get a good steel one. The ordinary cheap ones will do the work for a time, but soon get their jaws out of shape, and not only will not hold, but in slipping off the bolt head will generally be the cause of a slice of skin slipping off the knuckles or back of hand. This will probably cause another noise, and possibly a flow of language perhaps more readily understood than that of the engine.

Another pounding, which is quite often very severe, will be caused by a defective timer; the ignition will fail for one or more strokes and then take hold again with a good, heavy charge in the cylinder; this is often mistaken for carbureter trouble, even by old hands at the business. An old customer, coming to me with such a tale of woe, insisted that, with all due respect to my experience, he was confident the trouble was not with the timer, but, as a personal favor to me, he would try the suggestion. He found a few minutes' work in trueing up the contact points restored harmony.

Whistling, or hissing, if not traceable immediately to a slightly opened relief cock, will be caused by the packing blowing out at some point—usually the hardest place to get at. This will sometimes be so serious as to require immediate attention. In such cases, a temporary repair can often be made by first slacking up on the holding bolts near the blow-out, and then running into the open space some shellac; after allowing it to set a moment, tighten up the bolts.

Speaking of shellac, always have a bottle or can stowed away safely aboard, and see that it does not dry up nor become lost. It is invaluable in making up gasoline joints, as well as for use with gaskets. It is also a splendid insulator, and may be used many times and in many ways to help out of trouble.

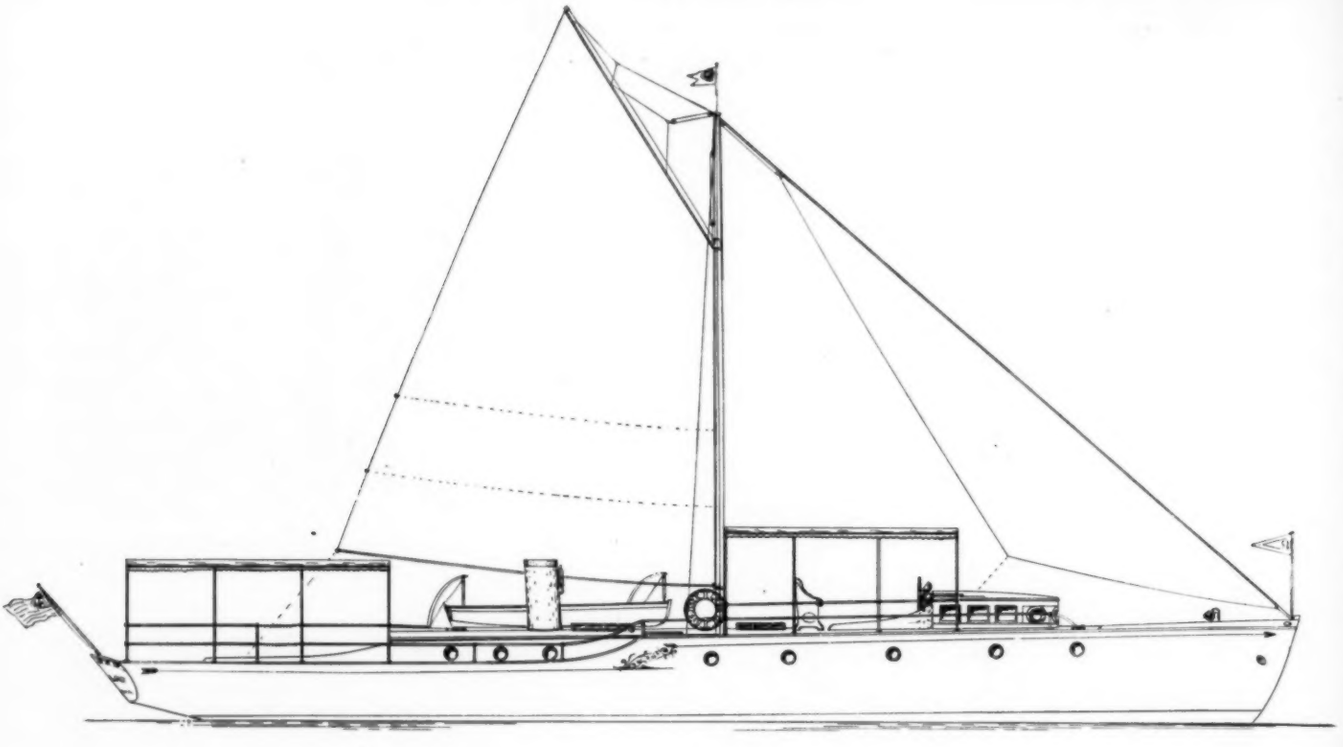
Another complaint sometimes voiced most emphatically is a lack of fuel, or a weak mixture. In the case of the two-stroke engine, this sounds like a combination cough, sneeze and whiff, accompanied by a blowing out of black smoke around the base, and sometimes a flame from the carburetor. With the four-cycle type there is a sharp crack from the carburetor intake, and usually a sheet of flame issues, with a strong possibility of igniting any loose oil which may be about the base. This back-firing, as it is called, may sometimes be caused by a weak spark, which, by being slow to fire the charge, allows the incoming fresh charge to become ignited and burn back before the intake ports are closed.

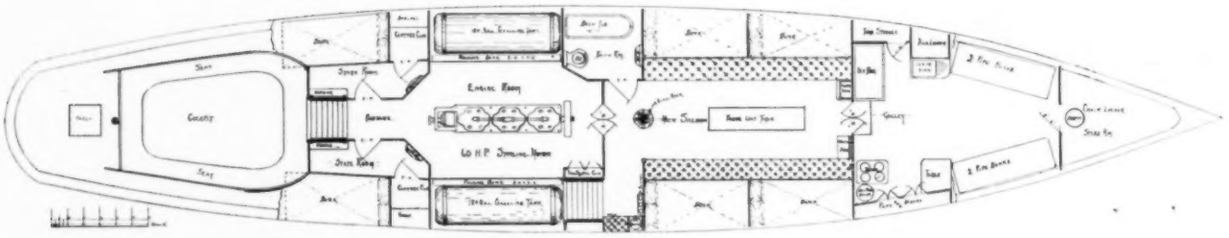
A weak mixture, as spoken of above, is also slow burning, and the effect is the same as with a weak spark.

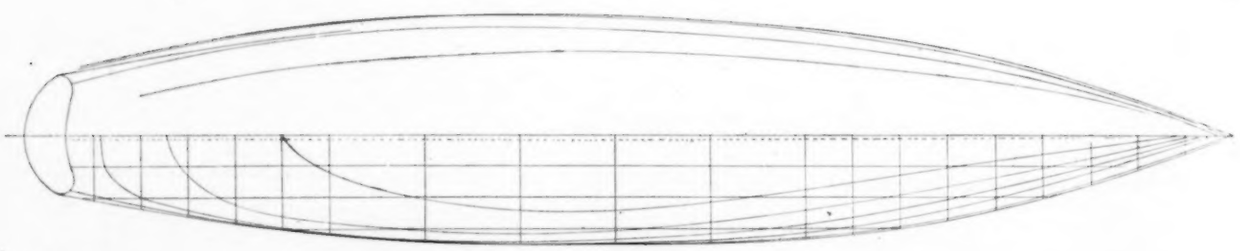
It is not the intention of this article to advise amateurs to do any great amount of tinkering with their engines, but to try and get them to study them so carefully as to be able to detect at once any out in their working. If we wish to have perfect understanding in our dealing with a man of foreign tongue, we must either study his language, or he ours, and as the engine cannot understand us, even although we do at times use sulphurous phrases, we must study its methods of letting us know just what is ailing.

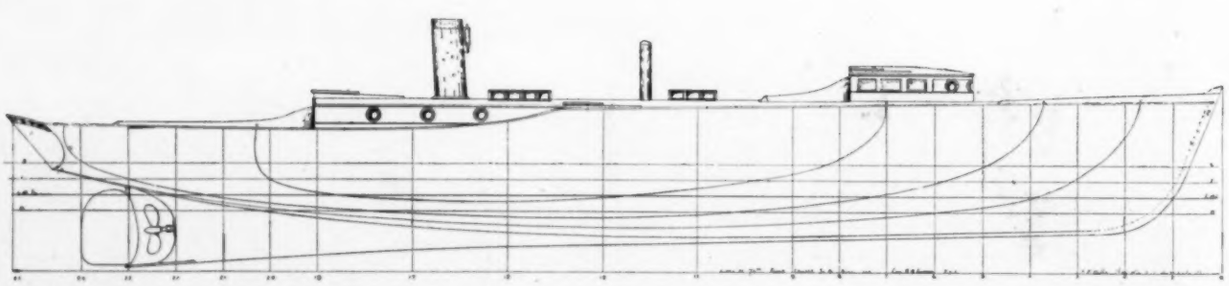
Should any trouble be beyond your powers as an amateur physician, call in a doctor of known and proven ability and don't kick at his charges. It has taken years of hard-bought experience to make him proficient, and he is justly entitled to a fair remuneration.

Erd, the 30-footer built by W. J. Oulette of Bay City, Mich., doing better than 30 miles. She is equipped with a six cylinder Erd motor.









Profile, accommodation plan and lines of Kee Lox III, the 76-foot cruiser being built by F. W. Miller, of Charlotte, N. Y., for Commodore W. P. Pembroke.

New Motor Boat Designs.

Kee Lox III, a 76-Footer.

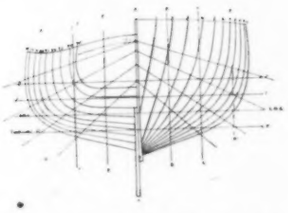
THE flagship of the Rochester Yacht Club, Kee Lox III, building for Commodore W. P. Pembroke by F. W. Miller, of Charlotte, N. Y., is somewhat of a change in the cruising power-boat type.

The owner has had considerable experience in the boating line and decided that a boat for use on Lake Ontario should be about 76 feet long, as under ordinary weather conditions this length would allow the boat to reach the crests of two waves, keeping her steadier than a shorter boat. The bow is sharp and has a very easy entrance; the lines aft are carried out full and clean so the boat will not settle, and are continued out to a yacht transom stern.

The boat is to be constructed rather heavy for this type, the main keel being 8-inch by 9-inch oak timber, and the frames being 2 inches by 3½ inches at the keel, tapering to 2x2½ inches at the sheer strake. The stem is bent white oak and the floors are heavy. The planking is to be 1½-inch long-leaf yellow pine, and to be thoroughly and securely fastened. The cabin houses, rails and other furnishings are to be of mahogany. The railings and stanchions for the awnings all to be of polished brass. The fittings of all kinds throughout to be polished bronze, and are to be furnished by the Horton Boat Company, of Rochester.

The yacht is to be fitted with a spar, and is to have an auxiliary spread of about 1,000 square feet of canvas in loose foot mainsail and jib. Port lights are used wherever possible in place of sash glazed windows. The decks are double with canvas between them.

The boat is to be driven by a 60-h.p. heavy-duty 6-cylinder, 6½ inch bore and 8 inch stroke, model D Sterling engine, and a speed of 12 miles per hour is expected. The engine will be as near the center of the boat as possible. The exhaust will be carried through the stack, and the whistle tank will also be located in the stack. The gasoline capacity is 360 gallons.



The arrangement has been laid out to accommodate eighteen people comfortably, exclusive of the crew.

Particular attention was given to the galley, both in arrangements and for plenty of light and ventilation. The headroom is about 7 feet 6 inches, and with a hatch practically over the stove, all smoke and fumes will be carried directly away.

The yacht will be electric lighted throughout by a generator connected to the engine and two 120-hour storage batteries, furnishing current for sailing light, masthead light and all lights under the awnings and a powerful searchlight, besides the interior lights.

The floors throughout will first be covered with linoleum and the state-room, main cabin passages and bathroom will have Wilton rugs. The cushions will be pan mohair, and cockpit seat and seat on bridge are to be of buffed leather.

A 14-foot power tender will be carried on the davits.

The designer and Commodore Pembroke have spent considerable time and study in developing this design to meet all of its requirements, and it is of interest, considering its size and quality, to know that the boat will be built for something less than $21,000.

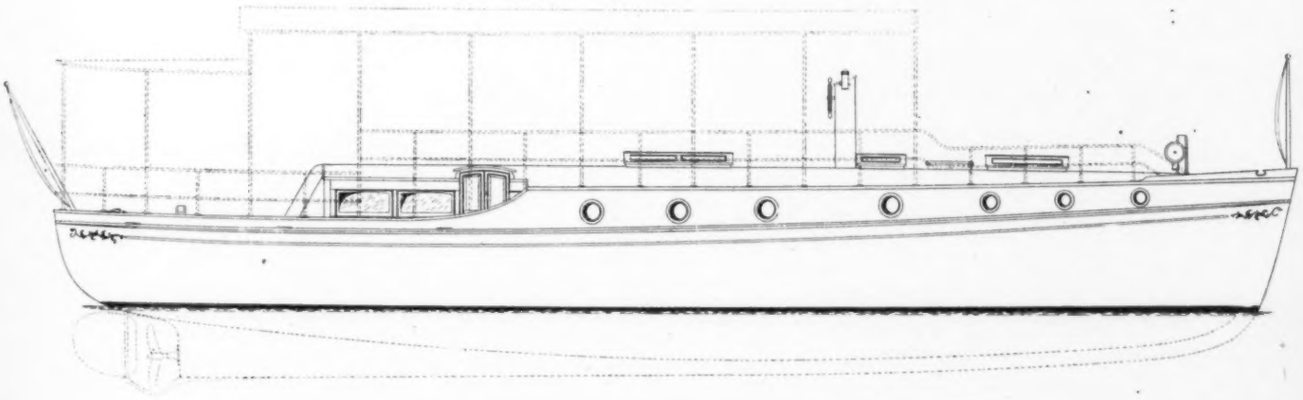
50-Foot Raised Deck Cruiser.

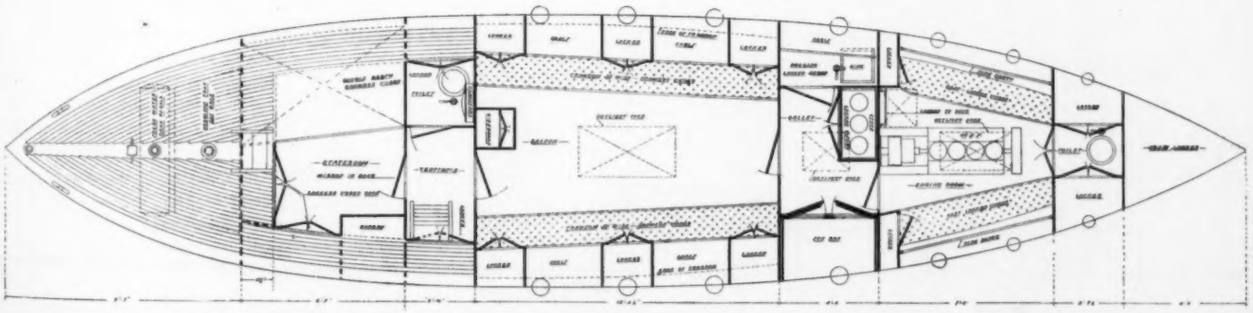
THE appearance of the 50-footer shown in the accompanying profile is that of the popular raised-deck type. There is no cockpit, however, the after deck being flush, and in several other respects she differs from the usual practice.

The boat was designed and will be built by Julius Peterson, of Nyack, N. Y. Her dimensions are as follows: Length over all, 50 feet; water line length, 46 feet 8 inches; beam, 11 feet; draft, 3 feet 6 inches; least freeboard, 3 feet 3¼ inches, with cabin headroom of 6 feet 2 inches. The frames are of white oak 1¾ inches by 1¾ inches at heads and 1¾ inches by 2¼ inches at heels, and are spaced 12 inches between centers. The planking is of cedar finished to a thickness of 1⅛ inches, and the decks are white pine 1¼ inches thick.

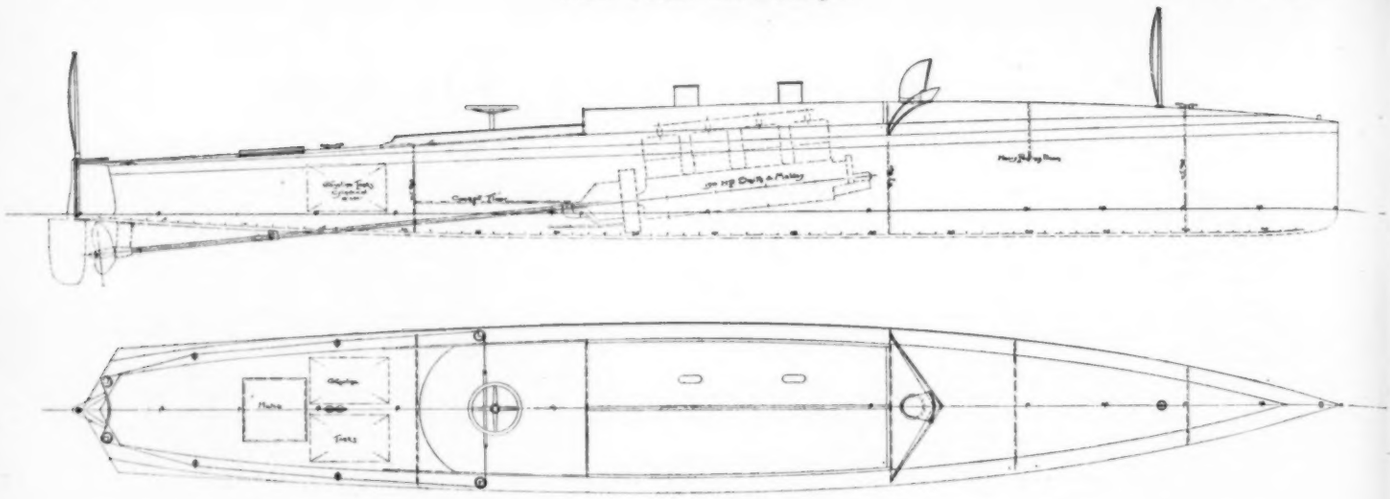
The motor will be either a 40-h.p. Lamb or a 25-h.p. Standard of four cylinders. It will be situated forward, which differs from the usual practice in this type of boat. Aft of the engine room is the galley, which with ice chest, lockers, etc., extends the full width of the boat. Amidships and also extending the full width of the boat is a main saloon 12 feet in length with transom seats along either side and thoroughly provided with shelves, lockers and a sideboard. Farther aft beneath the cabin trunk is a large state-room with double berth and between this and the main saloon on the port side is the toilet room, and on the starboard side the vestibule containing the companionway which leads to the deck.

The steering is done from the cabin roof as shown, and by utilizing this space a great addition in deck room is obtained. The boat is designed for a speed of between eleven and twelve miles an hour, and judging from her well-proportioned ends, her liberal freeboard and draft, she should prove an exceptionally good sea boat.





The 50-foot raised-deck cruiser which was designed and will be built by Julius Peterson, of Nyack, N. Y.



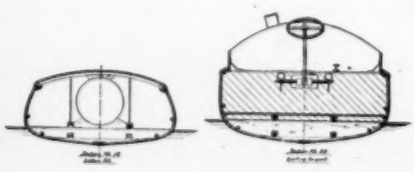
Commodore F. G. Bourne's 40-foot racer, which was designed by Messrs. Tams, Lemoine & Crane, and is being built by the Leyare Boat Works, of Ogdensburg, N. Y.

New 40-Foot Racer.

MESSRS. Tams, Lemoine & Crane have recently let the contract for the 40 foot high speed launch here shown, to The Leyare Boat Works of Ogdensburg, N. Y. She is being built for Commodore F. G. Bourne and will race next season on the St. Lawrence, where she is expected to give a good account of herself. The Commodore's boat will be 40 feet in length x 5 feet 5 inches beam. Her construction will of course be light, but will be substantial, and great care is being taken in selecting the materials to be used. The keel is to be in one length of yellow pine; the stem to be a bronze casting with an oak apron; and the stern post will be of white oak. The motor foundation will be unusually substantial, of oak knees set between bent frames securely fastened and carried well up the sides. The girders, which will run well fore and aft are of yellow pine. Her frames are of elm and her planking will be of mahogany, copper fastened. She will have three watertight bulkheads of elm. The material for the deck, which is being carefully selected, will be white cedar.

As will be seen by the accompanying plan, she will have a long turtle deck forward, two of her three bulkheads coming before the engine space. She will be equipped with a 150 h.p. Smith & Mabley motor, and great care has been taken in arranging the motor compartment so that all parts of the motor will be easily accessible. Aft of the motor compartment is the cockpit, the floor of which will be of white pine, and the coaming of mahogany. The gasoline tanks are being carefully installed, and have been thoroughly tested.

The boat will be steered by a horizontal wheel as shown. Mr. Crane has designed a special propeller for her and she probably will be very fast.



Another launch for racing in these waters is now being built from designs by Messrs. Tams, Lemoine & Crane for Mr. C. R. Hoag, of Newark, N. J., and with two such notable additions to the already large fleet of fast boats good racing for next season is already assured.

New Entrant for the British International.

THERE is now in course of construction and approaching completion at Robert Jacob's yard, City Island, a motor boat that is entitled to more than a passing notice.

When her owner, Mr. Frederick K. Burnham, ordered the plans and specifications for this boat, it was his intention to enter her in the races for the Gold Challenge Cup of the American Power Boat Association, to be held on the St. Lawrence next summer, and also to race her in any other motor boat events in which she could be entered. Since then a challenge for the Harmsworth Cup has been received and accepted, so that it is probable that this boat will make her appearance in these races also.

The principal dimensions of this boat are: Length over all, 39 feet 11 inches; load waterline, 39 feet 11 inches; beam, extreme, 5 feet 6 inches, and draught of hull not exceeding 10 inches. Her waterline is fairly full, running in an unbroken sweep from the forefoot to the stern, and there are no hollows anywhere in her model. The deck is quite full forward, which, combined with a liberal freeboard, should make her an exceedingly good boat in a seaway. No extremely light construction has been attempted, her scantling throughout being substantial, although not heavy. Her stem, keel and sternpost are of white oak; the frames are of selected oak, planed, steamed and bent to form, spaced 8 inches between centers, being made somewhat larger amidships and tapering gradually at the ends. She is double planked, the inside being of cedar and the outside of mahogany, with union silk between the two layers, all thoroughly riveted together with copper rivets. There is a long turtle deck forward, and her afterdeck extends 9 feet forward from the sternpost. Both this deck and the turtle-back forward are constructed substantially the same as the sides and bottom of the boat.

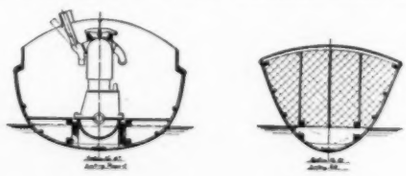
There will be two longitudinal trusses of Oregon pine, extending practically the full length of the boat, and there are a number of transverse stiffeners, forming a thoroughly substantial backbone for the boat, and, in addition, forming the foundation for the motor. The plans and specifications were prepared by Henry J. Gielow, of this city, and the various details have been thoroughly worked out by him.

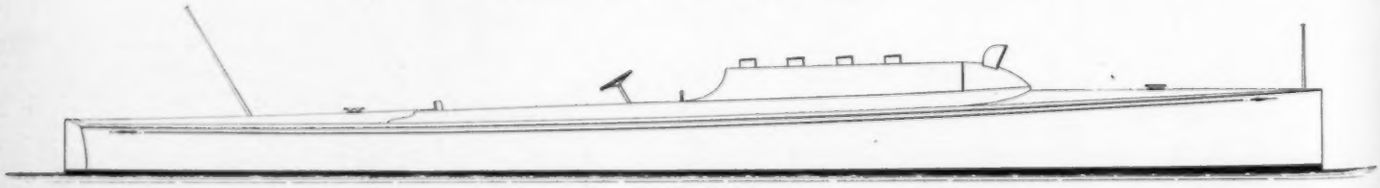
The motive power of this craft will consist of an eight-cylinder Sterling engine, capable of developing not less than 240 horsepower. The builders have given a great deal of thought to the production of this motor, and nothing has been left undone that could contribute to a thoroughly successful outfit. The bedplate is of aluminum bronze to secure lightness, but the other parts of the machinery are of the usual metals, carefully proportioned for the work required. The shafting will be of Tobin bronze, and the propeller manganese bronze, specially designed by Mr. Gielow for this boat. The motor is now being tested in the shop, and will be sent to the shipyard at an early date, where it will be installed without delay, so that the boat will be ready for her trial runs not later than the first of May.

40-Foot Day Cruiser.

THE accompanying plans show a very practical type of day cruiser designed by Mr. Charles D. Mower for E. G. Schmiedell, Esq., of San Francisco, for use on Lake Tahoe, California. The dimensions are forty feet over all, eight feet extreme beam and three feet extreme draft. The cockpit is eighteen feet long with the floor well above the waterline so as to give a clear view forward over the raised deck.

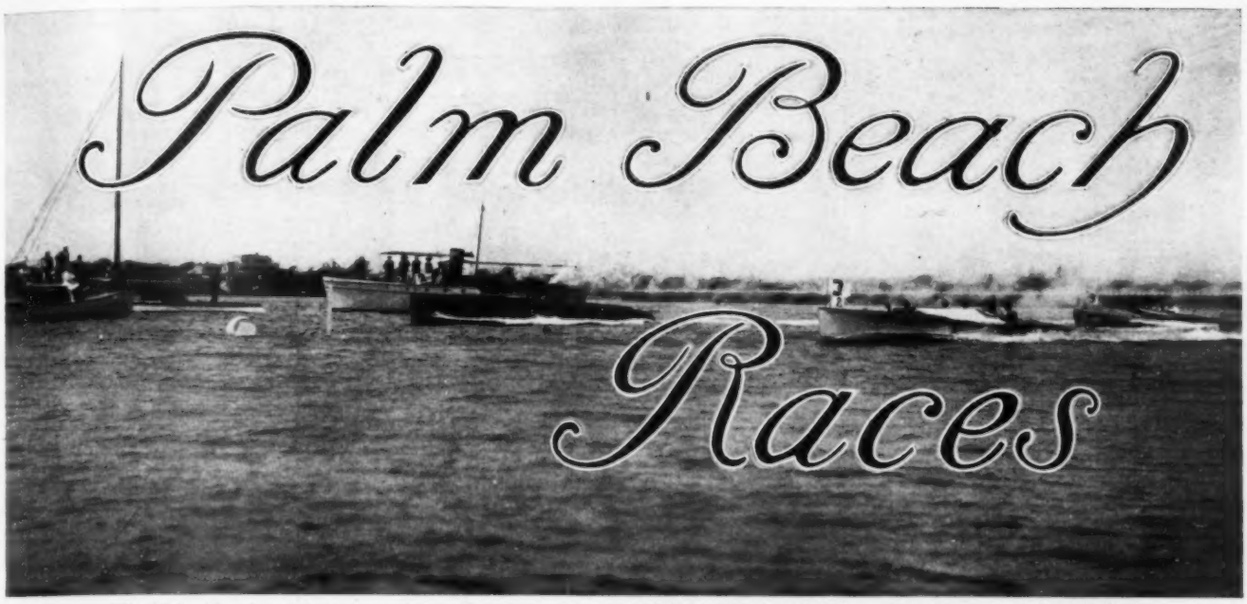
The engine is located amidships under a





The 40-footer designed by Henry J. Gielow, and building at Robert Jacob's yard, may be entered in the British International.

Palm Beach Races



The Palm Beach regatta starts the racing season of 1910—Buffalo Courier II, Diana and Dewey well bunched.

THE sixth annual Regatta of the Palm Beach Power Boat Association held from March 15th to 19th on Lake Worth, Florida, marked the climax of this season's motor boating activity at this popular winter resort, and as has been the case in the past created considerable interest among the motor boat enthusiasts. The races this year, however, while interesting as speed contests were less intersectional in interest than heretofore as the boats entered were nearly all Southern boats. The principal Northern entry was Buffalo Courier 11, entered by W. J. Connors. The experience of this boat throughout the week was most unfortunate, although undoubtedly the fastest boat entered, she was with one exception the only entrant which did not win a prize. Earlier in the week this unlucky boat got beyond control, spilled her crew into the water on a sharp turn and tearing madly along, picked her way unguided through a mass of piles and other obstructions and finally beached herself, sustaining some slight injuries. On the third day of the racing she met with another accident, to say nothing of her being penalized the day before for having exceeded her handicap in the Class C event and furthermore, she was later disqualified, after having won the speed trial, for not having entered 70% of the events for which she was eligible.

Of the sixteen boats entered the following eleven participated:

No.	Name.	Owner	Club or Port
1	Bruiser.	A. B. O'Hara	Rockledge, Fla.
2	Buffalo Courier II	W. J. Conners	Buffalo Motor Boat Club
3	Diana	George Gingras	Rockledge, Fla.
5	Dewey	W. F. Coachman	Jacksonville Power Boat Club
7	Gertrude F	Chas. Furtham	New York
8	Jack Rabbit	H. L. Willoughby, Jr.,	Sewalls Point, Fla.
9	Keego	Frank M. Andrews	Gilbert's Bar Yacht Club
10	Meteor	D. H. McMillan	Jacksonville Power Boat Club
11	Possum	H. L. Willoughby, Sr.,	Gilbert's Bar Yacht Club
14	Eau Gallie	G. F. Paddison	Eau Gallie Yacht Club

The races were held under the following classifications:

Class A. All Boats American Power Boat Association rating rule.

Class B. 32 feet and under, load water line.

Class C. 32 feet and over, load water line.

Class BC. All boats, load water line.

Class D. 17 miles speed and under.

Class E. 17 miles speed and over.

Class DE. All boats, speed.

The summary of the races during the week is as follows:

TUESDAY, MARCH 15th.

10.30 A. M., Speed Record Trial.

Courier II, 30.368; Diana, 24.835; Jack Rabbit, 22.896.

Buffalo Courier was declared the winner of the Palm Beach cup, but as was previously stated, was later disqualified for not having entered 70% of the events for which she was eligible.

2.30 P. M., Speed Contest, 9 Miles.

This event was open to Florida designed and constructed boats only, and the prize, the Association Cup (to be won twice) was won by Diana in 26 minutes and 3 seconds, Dewey getting second place in 27 minutes and 14 seconds.

3.30 P. M. Class A. 9 Miles. American Power Boat Association Handicap.

Jack Rabbit won first in this event covering the distance in 26 minutes and 40 seconds, with Diana second. Although Buffalo Courier II made the course in 22 minutes, and 9 seconds, her handicap brought her down to fifth place.

WEDNESDAY, MARCH 16th.

10.30 A. M. Class B. 4½ Miles.

Eau Gallie winner, Possum second. Prize T. S. Barron Cup.

11 A. M. Class C. 4½ Miles.

In this event Buffalo Courier II and Dewey finished in a spectacular dead heat, but were both penalized for exceeding their handicaps giving the race to Bruiser, the speedy little boat owned by A. D. O'Hara. Prize Greenleaf and Crosby Cup.

11.30 A. M. Class BC. 4½ Miles.

Diana winner, Jack Rabbit second. Prize Commodore Harrison B. Moore Cup.

3.30 P. M. Class BC. 18 Miles.

Possum exceeded her time allowance and the first honors went to Dewey with Eau Gallie second. Prize Arnold Constable Cup.

THURSDAY, MARCH 17th.

10.30 A. M. Class D. 4½ Miles.

Gertrude F winner, Possum second, prize Friend's Cup.

11 A. M. Class E. 4½ Miles.

Dewey winner, Jack Rabbit second. Prize Frank Tilford Cup.

Jack Rabbit was first over the line, but was penalized 5 seconds, putting her in second place.

11.30 A. M. Class DE. 9 Miles.

Eau Gallie winner, Bruiser second. Prize Still Rock Cup.

3.15 P. M. Class E. 4½ Miles.

Bruiser winner, Eau Gallie second.

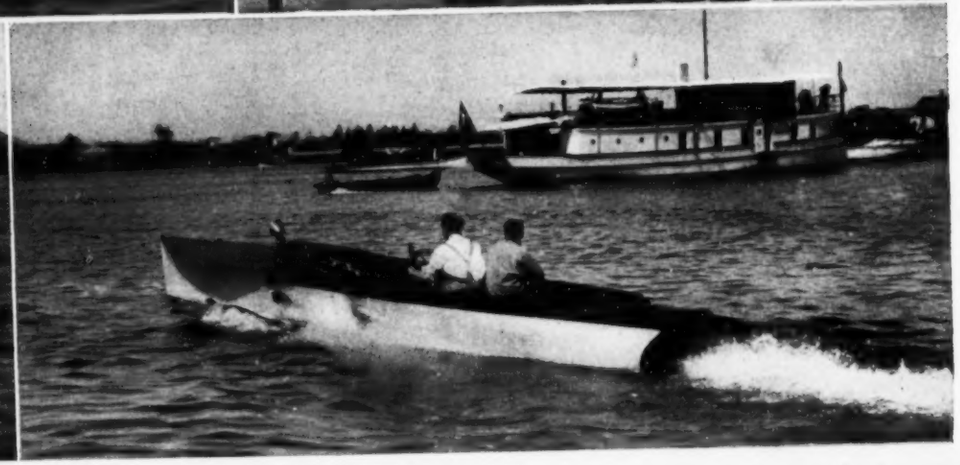
3.45 P. M. Class DE. 9 Miles.

Bruiser winner, Dewey second.

FRIDAY, MARCH 18th.

Seven boats were eligible to enter Friday's endurance race for the grand prize of $2500 (to be won twice) open to all boats of over 20 miles speed, but accidents reduced the field to Eau Gallie, Jack Rabbit and Dewey. Dewey covered the 103½ miles in 4 hours, 47 minutes and 26 seconds, thereby winning from Jack Rabbit and Eau Gallie, whose times were 4 hours, 58 minutes and 34½ seconds and 5 hours, 45 minutes and 23 seconds respectively.

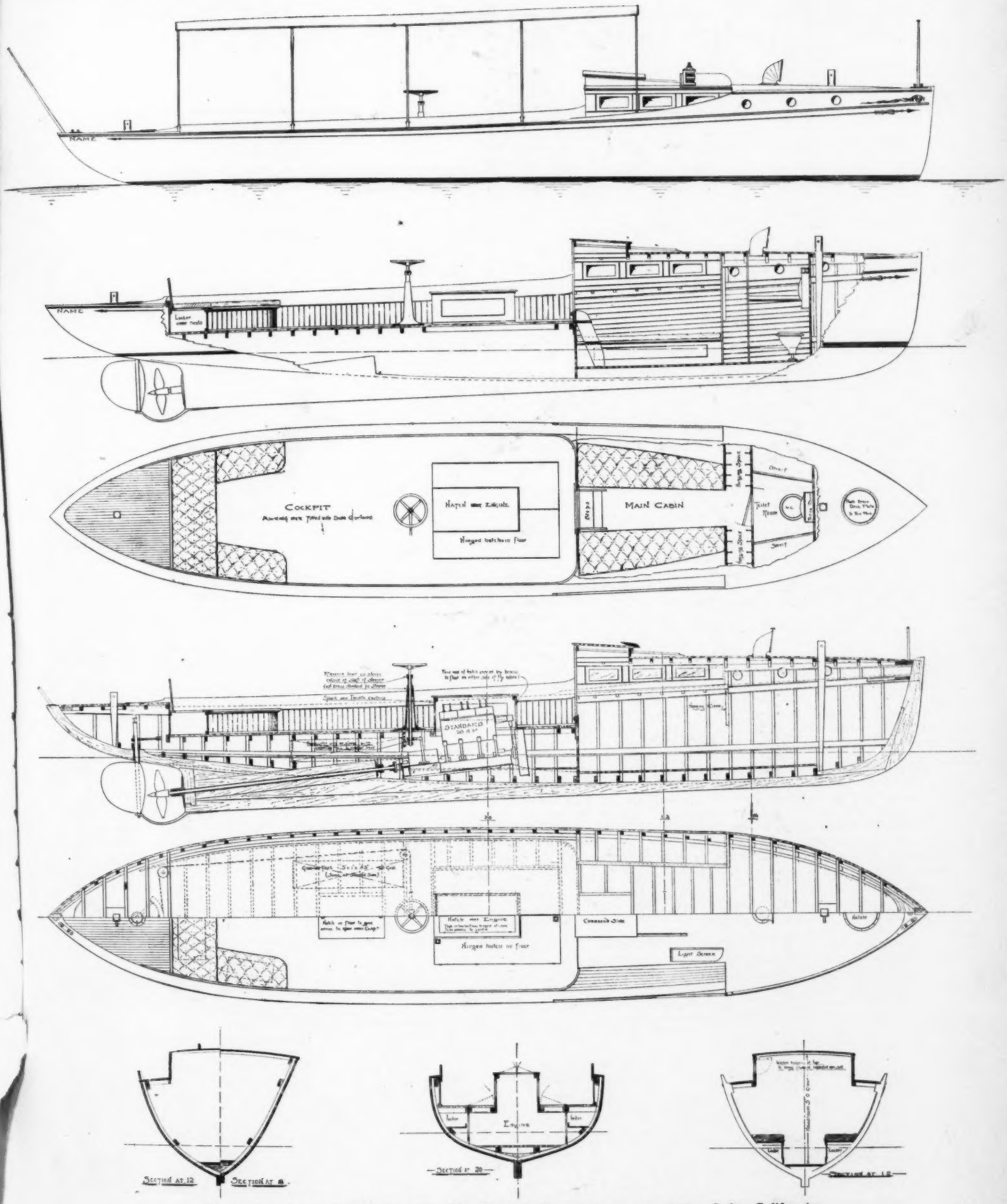
The closing event was a consolation race of 4½ miles, open to all boats of over 12 miles speed. Keego won in 15 minutes, 55 seconds, and Possum was second in 20 minutes and 6 seconds.



Photographs by Levick.

The motor boat racing at Palm Beach—the first events on the 1910 program.

Above, left, Dewey and Keego; on right, Possum. Below, on left, Buffalo Courier II; on right, Diana. In center, Bruiser; on left, Buffalo Courier and her crew at the dock; and on right, the measurers at work before the races.



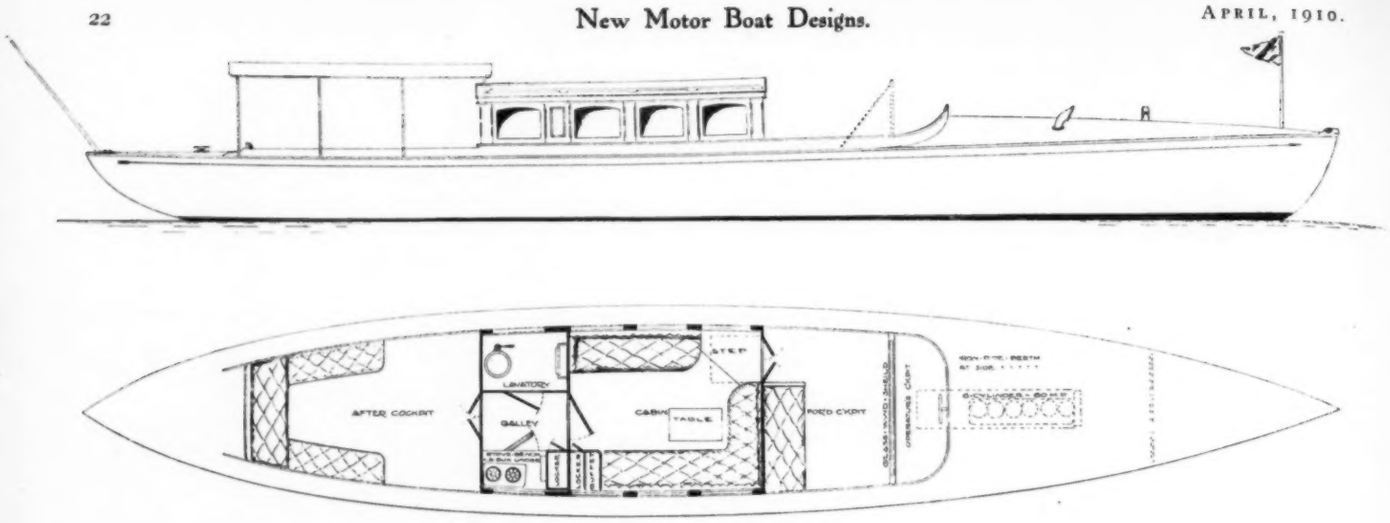
The 40-foot day cruiser, designed by Mr. Chas. D. Mower, for use on Tahoe Lake, California.

raised hatch and is made accessible by an arrangement of hinged hatches in the cockpit floor which has been tried and found practical in other boats of this type designed by Mr. Mower.

The cabin accommodations are forward and consist of a main cabin with two sofa transoms, two hanging spaces for clothes, and a toilet room with the usual fixtures. The head room in the cabin was kept down to five feet in order to give a good outboard appearance without excessive freeboard.

A 25 h.p. San Francisco Standard engine will be installed which will give a speed of about twelve miles per hour. She is designed for hunting and fishing trips, but the type is one that makes a very comfortable and serviceable for day cruising.

The motor boat racing at Palm Beach—the first events on the 1910 program. Photographs by Levick. ... Dawcy and Keego; on right, Possum. Below, on left, Buffalo Courier II; on right, Diana. In center, Bruiser; on left, Buffalo Courier and her crew at the dock; and on right, the measurers at work before the races.



Profile and accommodation plan of the 54-foot Elco express launch, described below.

54-Foot Day Cruiser.

THE 54-ft. Elco Gasoline Express Yacht, shown in the plan and profile, was designed and built by the Electric Launch Co., for Mr. C. B. Orcutt, of New York, and a boat of this design was exhibited at the recent New York show.

Her dimensions are as follows: Length over all, 54 ft.; beam, 9 ft.; draft of hull, 3 ft. The construction is of the very highest grade, with substantial scantlings, oak keel, frames and floors; yellow pine clamps; best of Southern cedar planking 1 inch thick and secured to the frames with copper boat nails riveted over washers. All hull metal work is of bronze and copper, to withstand the action of salt water.

The decks, outside and inside of cabin, and cockpits are handsomely finished in selected African mahogany, finished in the natural wood with spar varnish. The inside cabin surfaces are rubbed down to an eggshell gloss.

The motor, located forward, is fully protected under the turtle deck, with hinged, watertight hatch, making the compartment very accessible.

Seats are provided for a company of four or five in the forward cockpit, with observation seat and wicker chairs. Protection from head winds and flying water is obtained by a glass wind shield, which lowers into bulkhead pocket when not in use. From the observation seat a commanding view of the water ahead is obtained, the forward cockpit having no covering overhead. The cabin amidships is enclosed with plate glass drop windows of appropriate size and design, the cabin being large enough to seat comfortably a party of eight or ten. A lavatory compartment adjoins the cabin as well as a small galley, or pantry, with stove, bench, ice-box, cupboards and sink. The after cockpit is unusually large, where a party of ten or twelve can be seated comfortably on wide settees and wicker chairs. The after cockpit is protected overhead by a light roof supported upon brass stanchions, with canvas side curtains.

The boat is designed primarily for day service, but is so equipped that sleeping quarters for five can be arranged for at any time. The operator has a comfortable folding berth in the engine compartment forward, while in the main cabin two divans of the extension type form wide single berths. On the settees in after cockpit two can sleep, being fully protected from the weather when the canvas side curtains are lowered.

The builders believe that this type of boat will become very popular for cruising on the St. Lawrence River and the Great Lakes. The boat has a guaranteed speed of fifteen miles an hour, obtained with a 60 h.p., six-cylinder Standard gasoline marine engine. The gasoline tank has capacity of 100 gallons, permitting the boat to cover a distance of 150 miles on one filling of the tank. An electric light plant is installed, with electric lights throughout the cabins and cockpits. The boat will be delivered to Mr. Orcutt on May 15th and will be used by him at Alexandria Bay, St. Lawrence River.

Mr. Michael Cudahy, of Chicago, has placed an order for a 57 ft. Elco gasoline express yacht which will be the duplicate of Mr. Orcutt's boat except that it will be 3 feet longer. Mr. Cudahy's boat will have the same power equipment, a 60 h.p., six-cylinder Standard engine, the builders guaranteeing a speed from the boat of fifteen statute miles per hour. Mr. Cudahy intends to use his boat at Mackinac Island in Lake Michigan, and the yacht will be ready for delivery on May 1st.

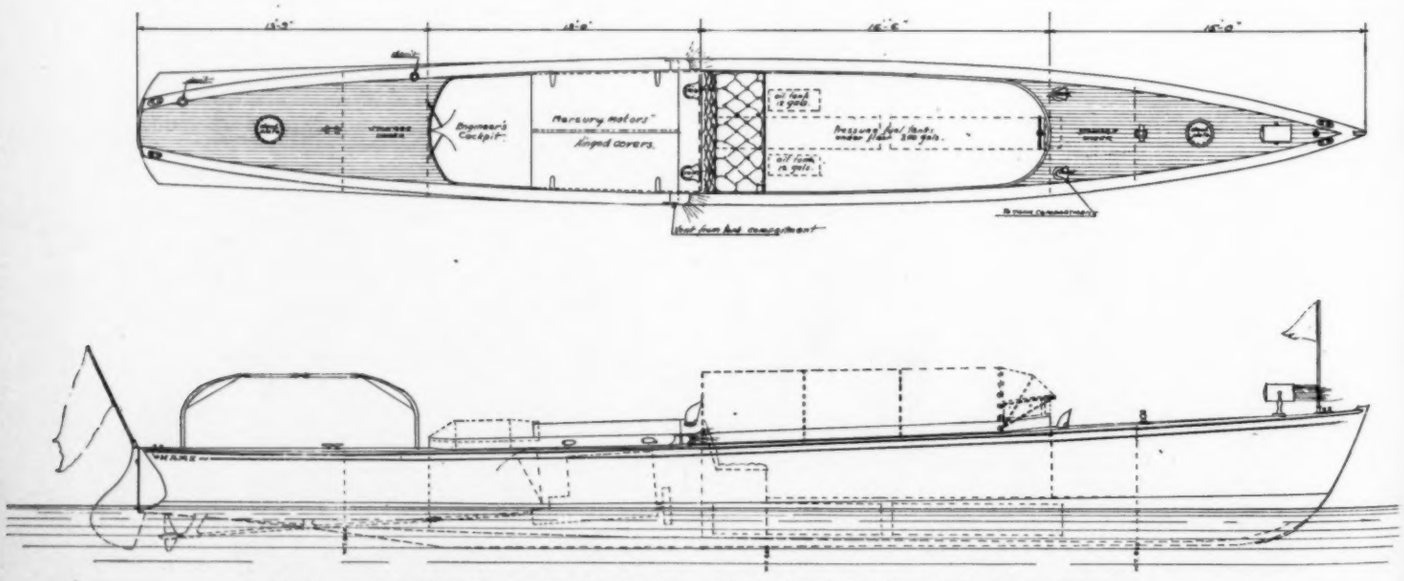
The Three Twins.

THE summer colony at Bar Harbor will be treated to some exciting sport next summer when the three 58-foot speed boats now building by the Reliance Motor Boat Company, of New York, are delivered.

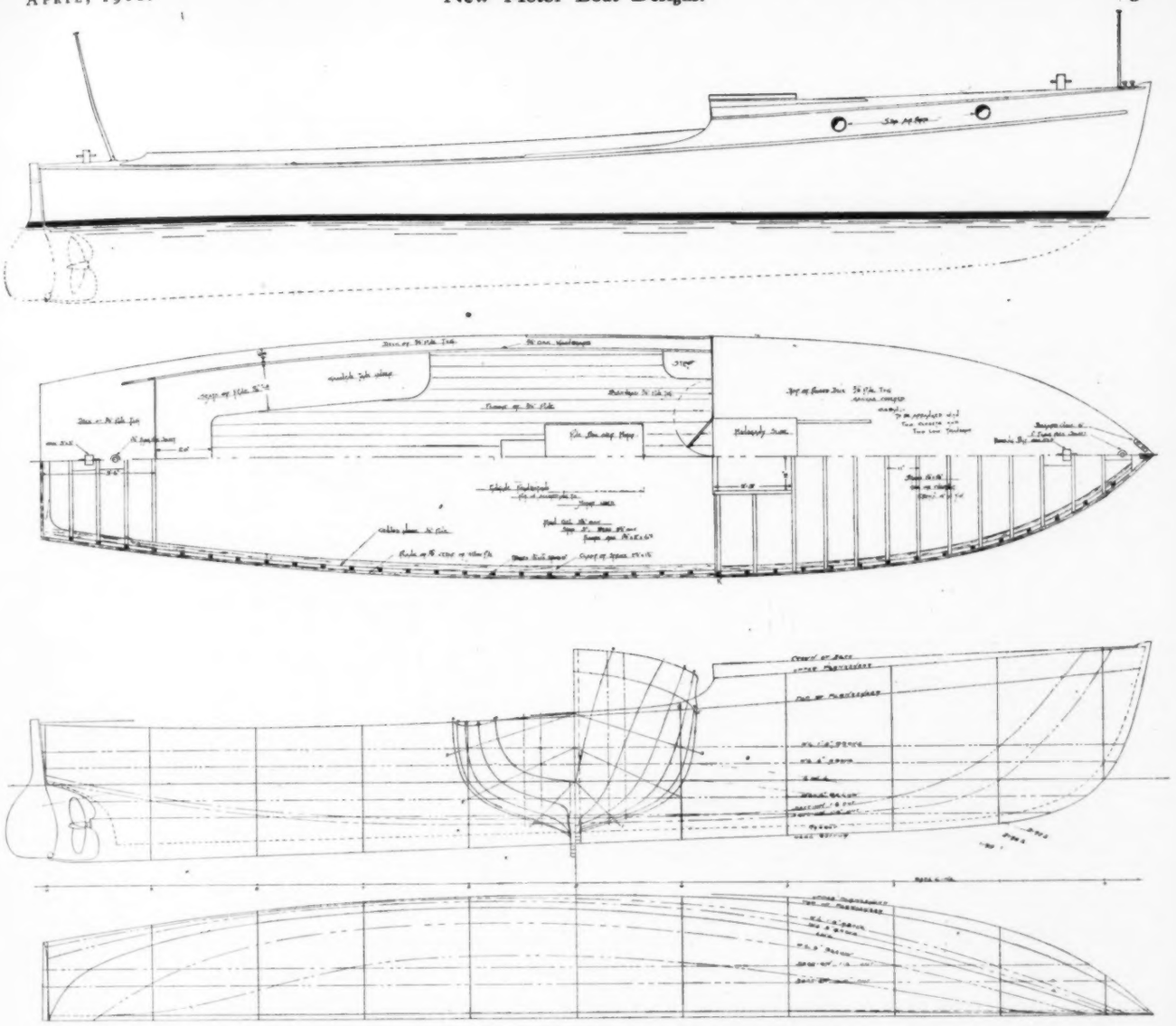
These three boats, which will have a guaranteed speed of 24 miles per hour, are being built exactly alike, and when finished their owners, namely, Mrs. Frances S. Mitchell, Mr. Clement B. Newbold and Mr. Edgar Scott, all of Philadelphia, will draw lots for the boats, and then race them at Bar Harbor, where they all have summer homes.

It will be very interesting to follow up the results of these races and see how much difference there is in the speed of the boats, as it is a well-known fact that boats built exactly alike will often have differences in speed.

These boats, which are called the Three



Outlines of the Three Twins for Bar Harbor, building by the Reliance Motor Boat Company.



H. B. Greene's 33-foot day cruiser was designed by Fred. D. Lawley.

Twins by their builders, are built in the finest possible manner and are of selected mahogany throughout. They are 58 feet in length with a beam of 7 feet, and will draw 2 feet 4 inches. The keel and stern are of white oak sided 3 inches, which assures a good strong backbone.

The timbers are 1¼-in. x 1½-in. white oak, and are spaced on 12-in. centers.

The planking is of 7/16-in. mahogany, and the boats are planked with the seam batten construction, copper fastened and all holes plugged with mahogany plugs.

To further stiffen the hull there is one yellow pine keelson 2 in. x 3 in., two yellow pine bilge stringers 2½ in. x 2½ in., and two yellow pine clamps 3 in. x 3 in. tapered at the ends.

The bulkheads, which are watertight, are made of ¾-in. spruce, with oak stiffeners.

The coaming, plank sheer and decks are all of mahogany, as is the interior of the cockpits.

At the forward end of the passenger cockpit there is a glass wind-shield, which is removable. In bad weather a spray hood, supported on brass bows, can be raised over this cockpit and closely fitted down on top of the wind-shield, which makes it possible to operate the boats in all weathers.

The engine beds are of spruce, and run well fore and aft so as to distribute the vibrations of the engines.

The engine equipment is furnished by the Mercury Motor Company, and consists of two six-cylinder, four-cycle, 6-in. x 6½-in. motors capable of developing 75 h.p. each. They will use the Atwater-Kent system of jump spark ignition, and a special oiling system with two pressure tanks under the cockpit floor.

There will be installed also a Truscott single-cylinder lighting set, which will completely light the boat, and also a 9-in. 2,200-candle-power searchlight, which can be controlled from the steering wheel. For emergency use there will be installed four 6-volt 40-ampere-hour Exide batteries.

Steering will be done from the forward cockpit, where there will be an 18-in. auto wheel connected to a bronze quadrant under the afterdeck by 5/16-in. phosphor-bronze steering cable. There will also be a steering lever in the engineer's cockpit in case the boat should have to be handled by one man.

The propeller shafts will be supported outboard by bronze struts with babbitt metal bearings, which are connected by tubing to grease cups in the engine room.

Rubber mats will be provided to cover the decks and cockpit floors.

The boats are to be varnished inside and out, with the exception of the space below the cockpit floors, which will be painted, and below the water line outside, which will be finished with three coats anti-fouling green copper.

A 12-foot bright-finished dinghy will be carried on davits on the afterdeck.

While these boats are a departure from the ordinary run of open boats, still there is no doubt that they will prove popular, and it is quite probable that in a few seasons there will be quite a fleet of these boats at Bar Harbor and other fashionable seaside resorts.

The 33-Footer, Snap Shot.

THE accompanying plan shows a boat designed by Mr. Fred D. Lawley, and now being built by Jacob Boyle, of Lynn, for Mr. H. B. Greene, of South Boston, Mass., whose business as a marine photographer necessitates a boat of good heavy-weather qualities and fairly good speed.

She will have a fairly high bow with plenty of flare to keep her dry. The cabin will be 13 feet long with 4½ feet headroom; plenty of locker room, toilet, and good sleeping accommodations for two people.

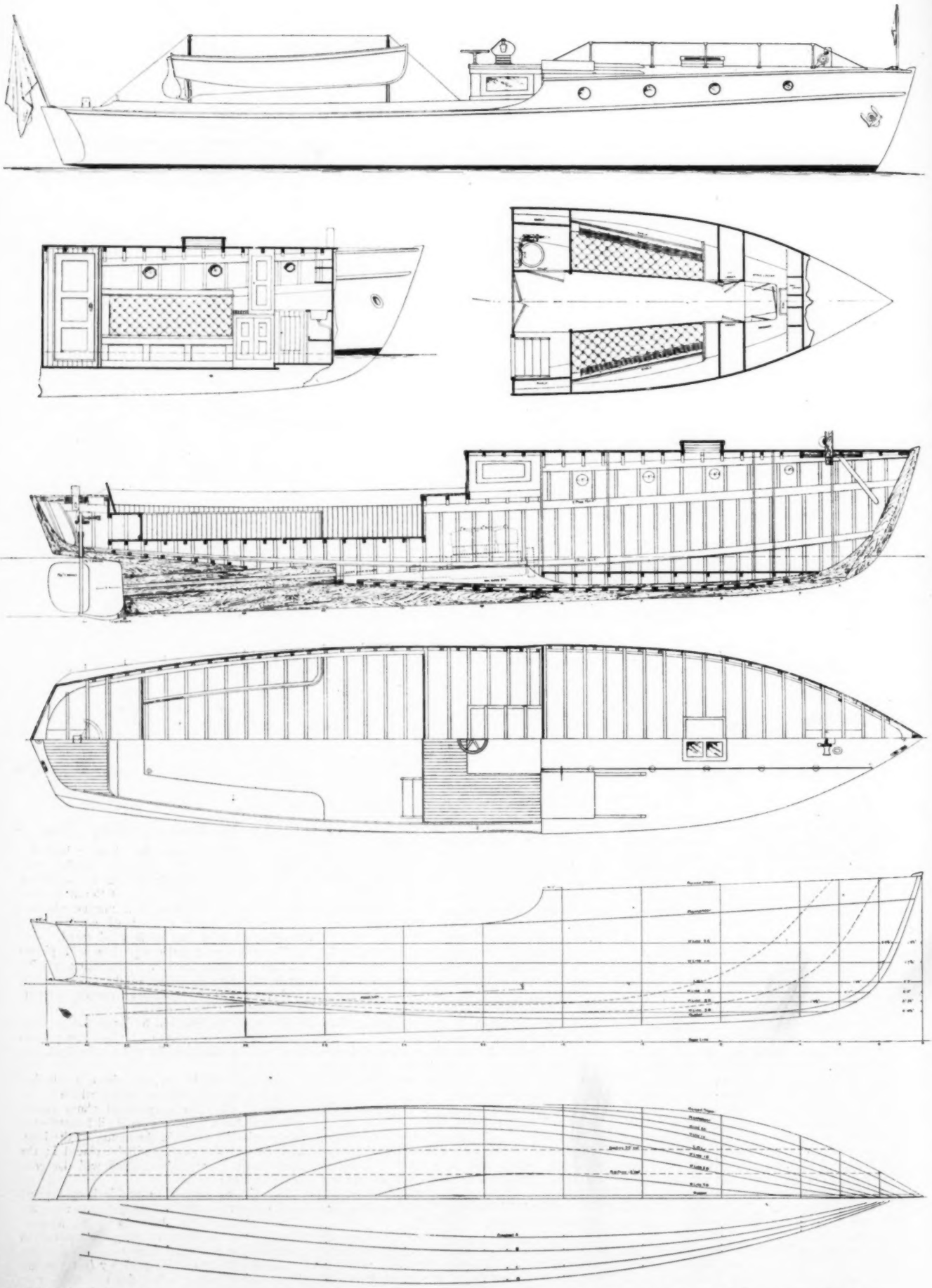
The open cockpit will be large and as deep as possible. Two gasoline tanks of 30 gallons each will be placed under seats in cockpit, one on each side.

The boat will be propelled by a 4-cylinder, 18-25-h.p. type B Sterling motor, which is expected to give her a speed of about eleven miles per hour. The engine is all housed over in cockpit and about in the centre of the boat, and the steering wheel will be placed in the centre, near reverse lever, which will also contain throttle controls.

Mr. Greene intends using his boat a great deal in securing illustrations for magazines and newspapers, and for obtaining special illustrations for Motor Boating along the coast from Cape Cod to Rockland, Maine.

She will be 33 feet long, with 7 feet 3 inches beam and 2 feet 4 inches draft.

Weather permitting, she will be launched about April 1st, and will be named Snap Shot.



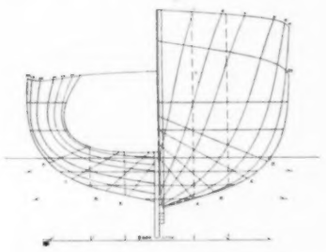
Yankee II, the 40-foot day cruiser designed by Frederic S. Nock for Mr. Miles L. Carter, to be used for hunting and fishing.

Yankee II, 45-Footer.

THE plans of Yankee II, shown on the opposite page are by Frederic S. Nock, and the craft was built at his yard. The owner, Mr. Miles L. Carter, of Attleboro, desired a boat that would be suitable for day cruising, have ample deck and cockpit room and not have a greater part of the boat used for the cabin. He is an ardent sportsman and spends considerable time fishing and shooting. A pulpit will be fitted forward so that he can try his hand at sword fishing.

The plans show the interior arrangement which has been adhered to in the main, the exception being the addition of a few lockers and shelves. In spite of the fact that the boat is built for a day cruiser it affords good sleeping accommodations in the cabin for four persons. The Pullman berths are upholstered and fitted with spring cushions, and when not in use form backs for the transom cushions. At the forward end of the cabin there is a good sized galley with sink, ice-box, etc. Sideboards closets, lockers for glass and chinaware are also arranged in their respective places. In the after end of the cabin on the port side is a toilet room fitted with yacht closet and folding lavatory. The water tank is forward, the water to the lavatory and sink being fed by gravity.

The engine room, which is situated under the bridge deck contains a 45-65 h.p., six-cylinder Sterling engine, and the small house,



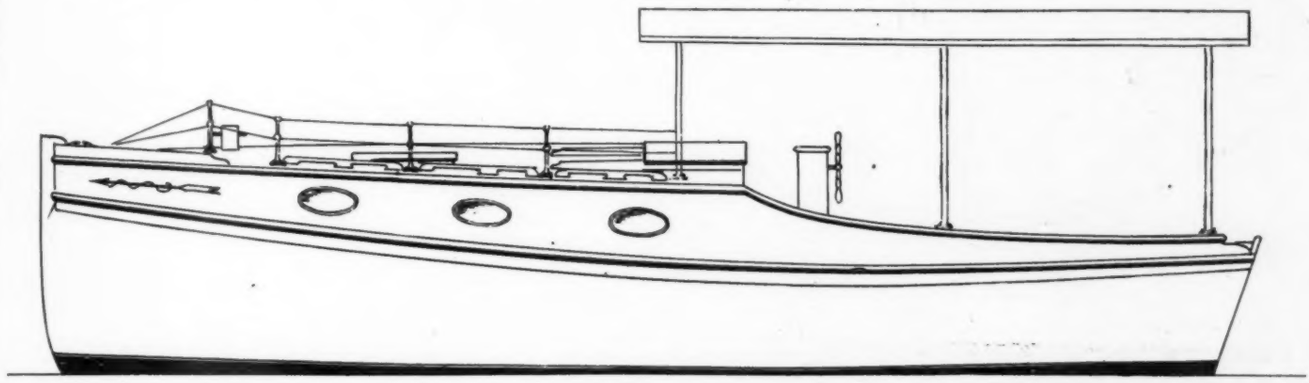
which is really a continuation of the raised deck, admits of having standing room all around the engine. On either side of the engine room and well up under the decks are the gasoline tanks, each being of 65 gallons capacity. A rotary bilge pump and a generator are also situated under the bridge decks. The generator will furnish the current for the cabin lights, sailing lights and searchlight. Storage batteries will be used in connection with the lighting outfit.

The engine is entirely controlled from the bridge deck. The levers for the control of the spark and throttle and the reverse gear being brought up close to the hand of the helmsman. A brass binnacle with the 7 inch Ritchie compass is secured to the deck forward of the steering wheel, the latter being of the automobile type.

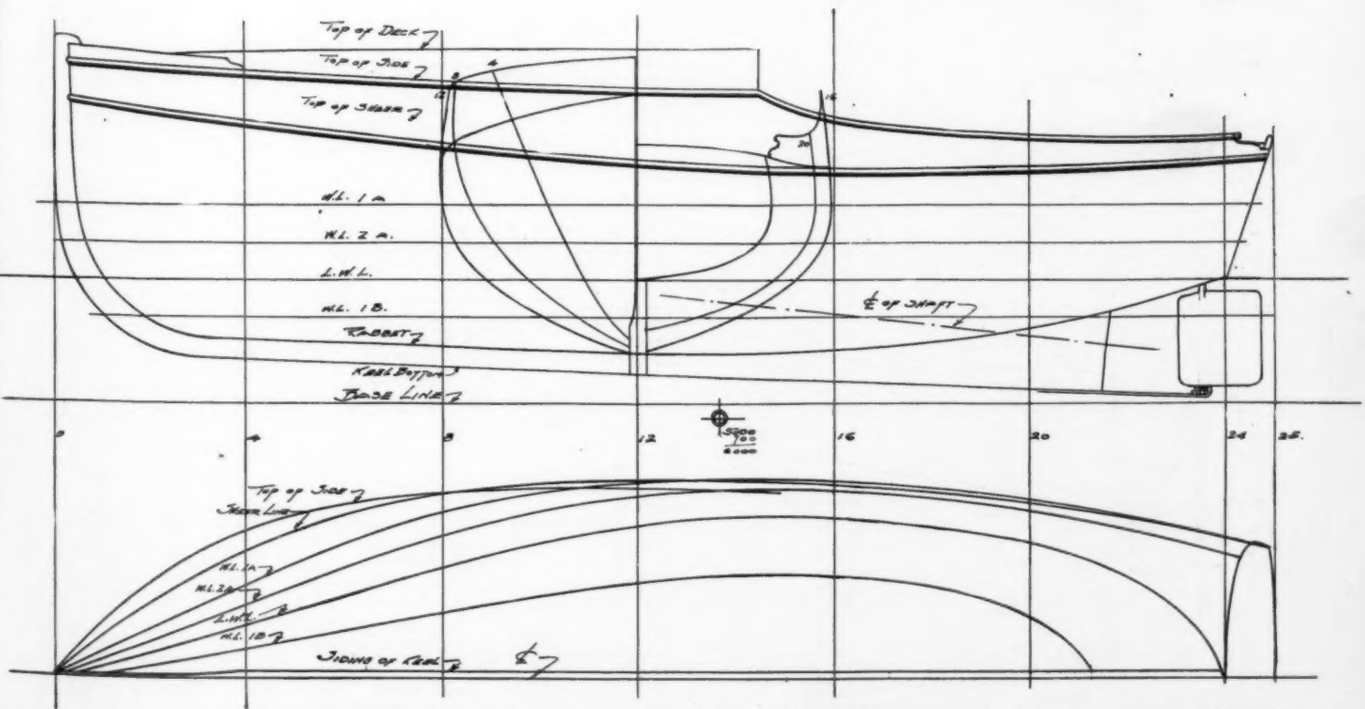
A pipe berth is fitted in the engine room in such a manner that during the daytime it is arranged to slide aft under the cockpit deck. In this manner it does not use up the available room alongside the engine, and affords accommodations for a paid hand if desired. A 12 ft. power tender, equipped with a 5 h.p. Waterman engine, will be carried on the davits, which are so arranged that the launch can be swung inboard and securely lashed. A hand rail on the raised deck affords protection for those who have to go forward in rough weather, and a rail on either side of the bridge deck affords the same service for the helmsman.

The anchors, which are stockless, are so arranged that they will be carried in the hawse pipes, thus avoiding a lot of unnecessary handling, and covering of the deck with mud and dirt as so often happens when the anchors are brought on the decks. The cockpit deck is watertight and drains aft through very large scuppers.

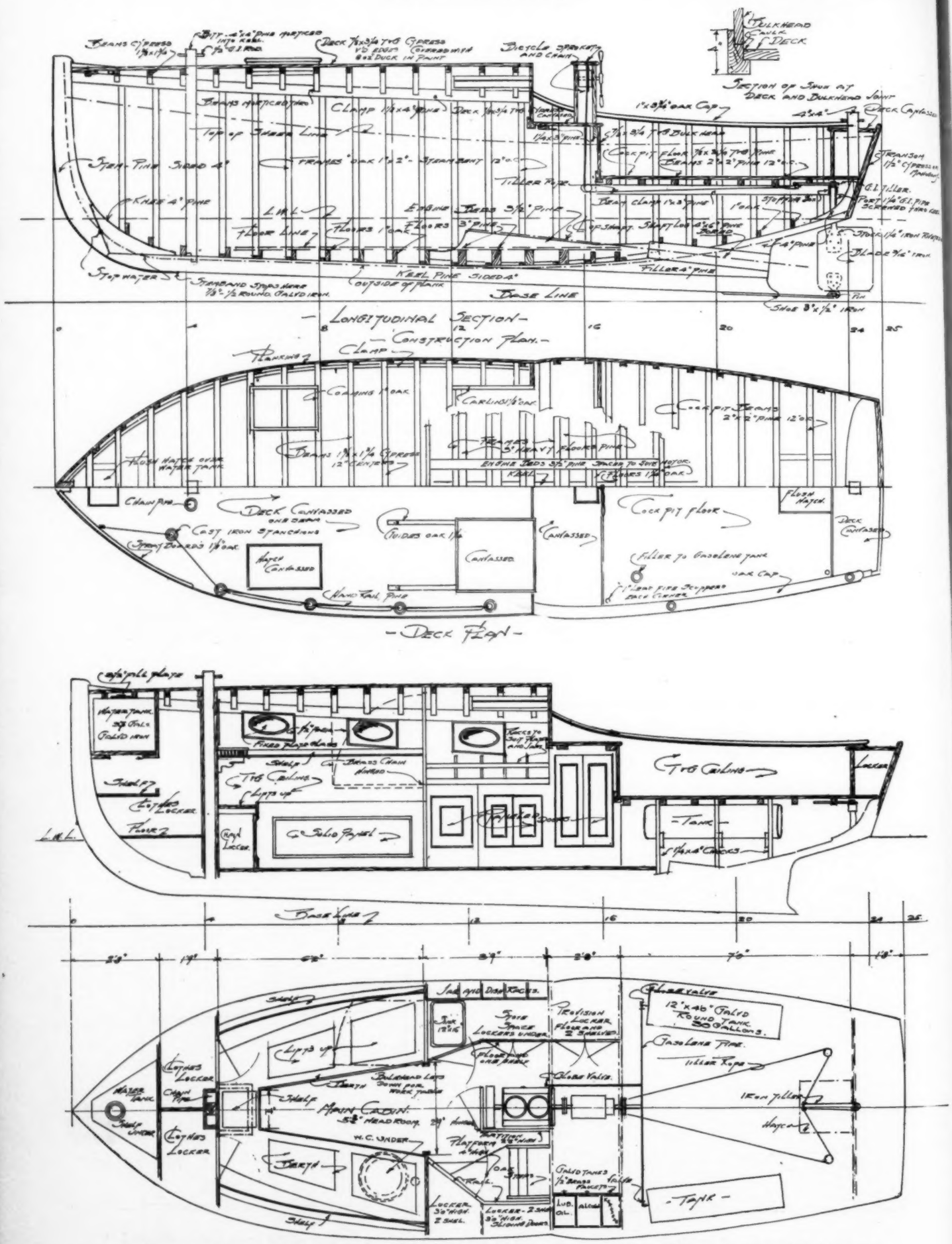
While no effort has been made to keep down the weight of the boat by lightening her construction, her lines and liberal power should give her a speed of about 12 miles.



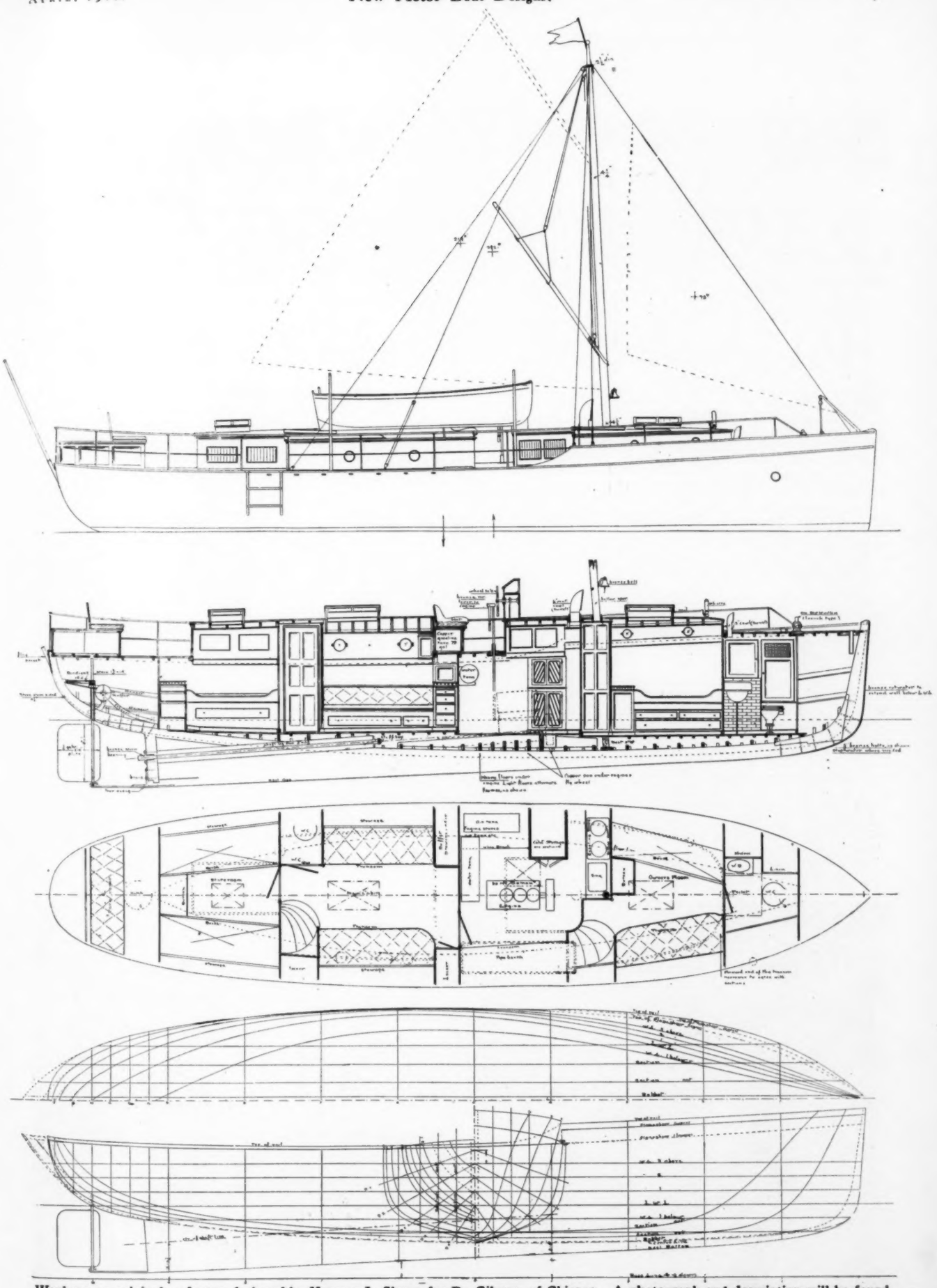
OUTBOARD PROFILE



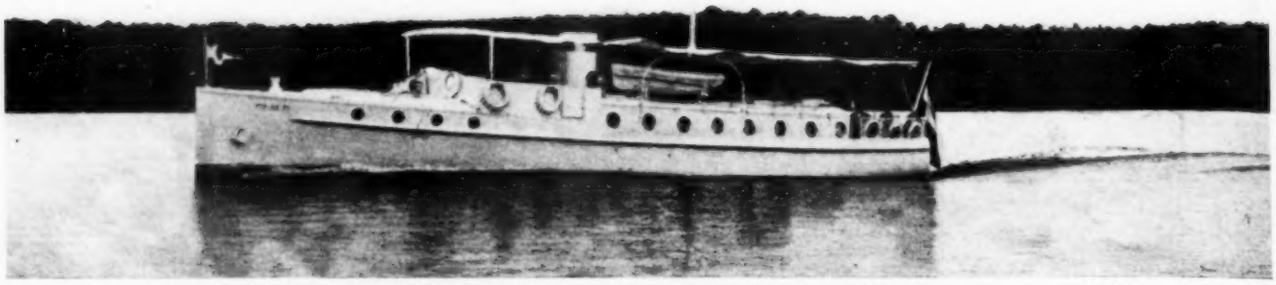
A 25-foot cruiser designed by Mr. H. P. Johnson, in which he has included all the features of the small cruiser described in his article in the March issue of MoToR BoatinG.



Construction and accommodation plans of Mr. Johnson's 25-foot cruiser, the profile of which appears on preceding page.



Waubesa, an original 45-footer, designed by Norman L. Skene, for Dr. Gilmer, of Chicago. A photograph and description will be found on another page.



Pik As VI has the long, low, easy lines of the torpedo boat.

Pik As VI--A German 66-Footer.

WE are apt to think of Germany as rather less aggressive in the field of motor boating than either France or England, but as a matter of fact she bids fair to become as prominent in this field as she has become in yachting, and whatever her standing, she has produced some remarkably good boats.

One of the latest of these to appear, and in some respects one of the most interesting motor boats that Germany has produced, is Pik As VI, 66-footer, recently completed for Mr. Rudolph Hertzog. The boat is remarkable not so much for the number of persons that it can accommodate but for the high degree of comfort provided for a limited number. Her interior appointments are luxurious in the extreme, but while interesting to the American motor boatman as an example of what may be done in this line, it is hardly of the character to appeal to him seriously.

The hull is of ⅛-inch steel and has an overall length of 66 feet, a water-line length of 64 feet 7 inches, a maximum beam of 11 feet, a draft of 31½ inches, and minimum freeboard of 3 feet 3 inches. The superstructure is of spruce, and the deck planking is of Columbian pine.

Extending from the stem, aft to the bridge deck, is a long, low turtle deck, beneath which is the forecastle. The bridge deck is ample and contains all controls, so that the boat is under the management of the man at the wheel. Aft of it, extending to the cockpit, is a long, low cabin trunk; this is surmounted by a short, thick stack and signal mast, which, together with the boat's long, low, easy lines, give her somewhat the appearance of the torpedo boat. The cockpit is shallow and extending, as it does, to the transom, provides seating space for quite a number of people.

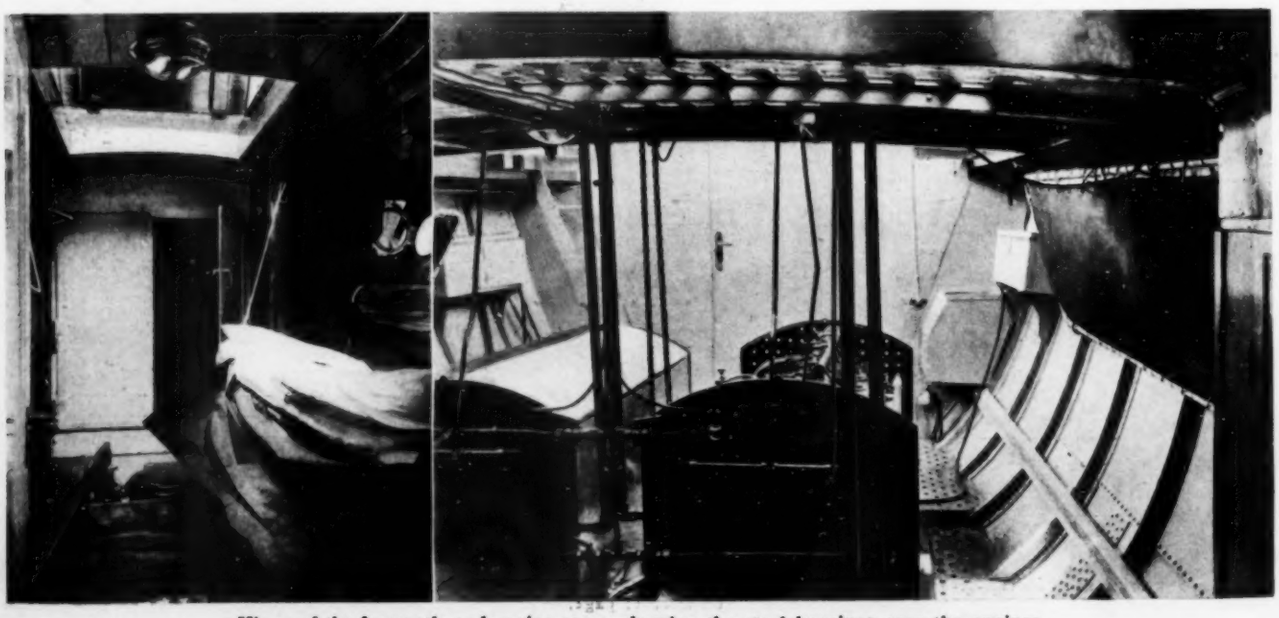
There is a shallow cockpit aft, extending to the transom.

Aft of the forecastle and beneath the bridge deck is the engine room. The power plant consists of two four-cylinder Durkopp motors, developing a total of 110 horsepower, which, driving a pair of Zeise propellers, give the boat a speed of twelve knots. An interesting feature of the engine room is the steel housings which inclose the engines. These may be seen in the accompanying illustration, which shows the cover of one of them removed. All of the engine-room fittings are of steel, which, together with the steel hull, is a departure from American practice. The gasoline feed pipes are of heavy copper and are carried above decks from the tanks to the carbureters.

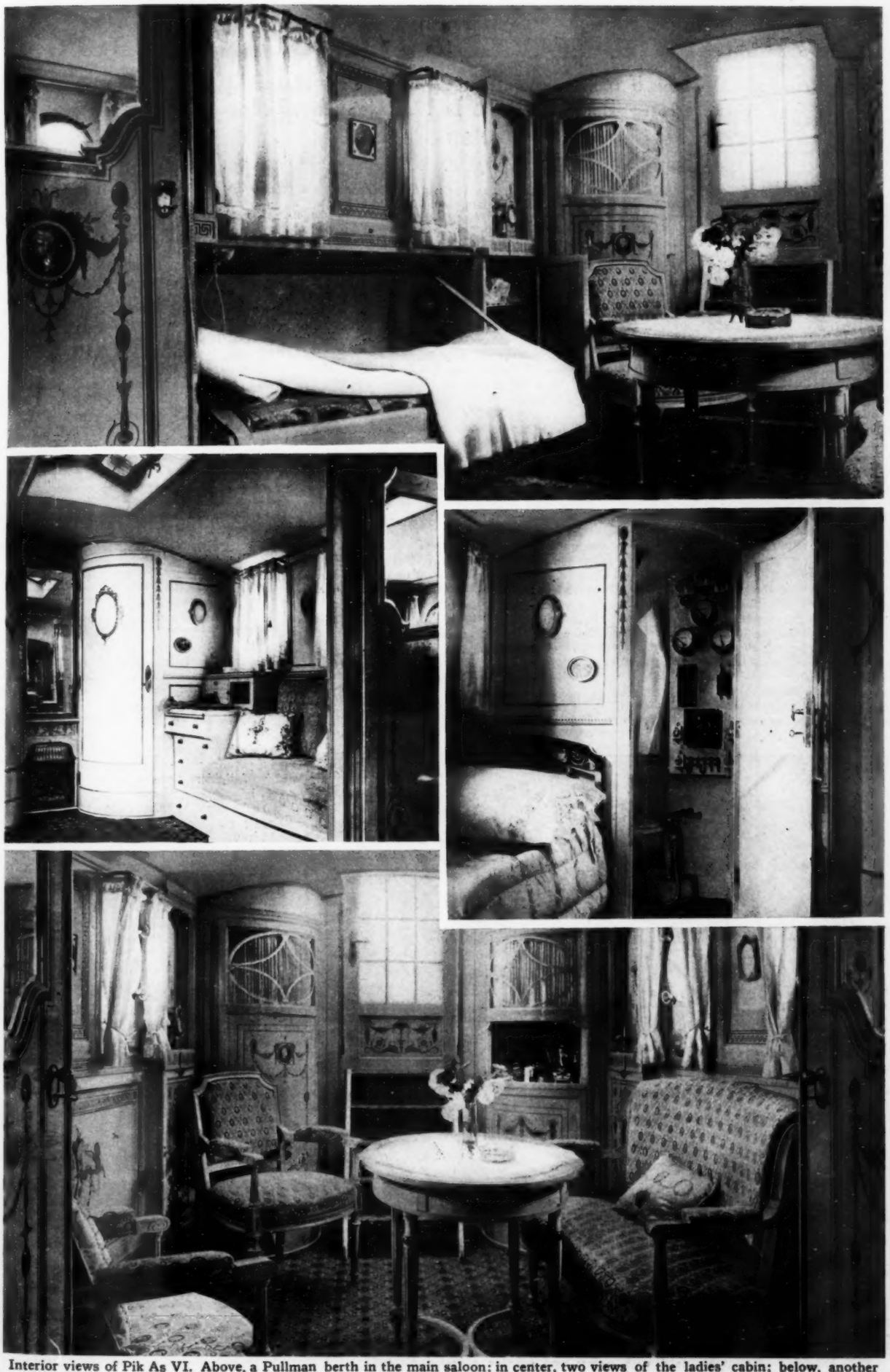
Aft of the engine room is the ladies' cabin, which is richly decorated in ivory white and gilt, and has its own toilet room adjoining. This room is provided with a grate, which adds to its snug appearance, and a glance at the illustration will show that none of the space has been wasted.

Adjoining this room is the saloon, which is roomy for a boat of this size and will comfortably seat six persons. Instead of the transom so common in American practice, Pullman berths have been used, occupying the space beneath the deck at either side, and when closed making the walls of the cabin flush with those of the cabin trunk. The treatment in this room is in the style of Louis XVI, and is an example of the possibilities of this style and of the last word in luxurious finish.

The boat is lighted throughout with electricity, and for supplying the current a storage battery is employed, with a charging dynamo driven from one of the propeller shafts. There is also a complete system of telephones.



Views of the forecastle and engine room, showing the steel housings over the engines.



Interior views of Pik As VI. Above, a Pullman berth in the main saloon; in center, two views of the ladies' cabin; below, another view of the main saloon.

Navigation for the Motor Boatman.

The Principles, Which if Mastered, Infinitely Increase the Possibilities of Motor Boating. For the Motor Boatman Who Is Not Content to Hug the Shore.

PART I

By Capt. B. D. Reese.

Editor's Note.—The following article is the first of a series on navigation by Capt. Reese, a navigator of long experience and the instructor of the Yachtsman's Club of Philadelphia. For the benefit of those of our readers who are taking up the study of navigation for the first time, and for those who wish to overhaul their knowledge of the subject preparatory to putting it into commission for another season's use, we have decided to start with the first principles and definitions, elementary as they may seem to the more experienced. The later articles will take up the practical problems of navigation, and we believe will prove of value to all who are interested in this subject.

THAT the practical navigation of a motor boat on the ocean and out of sight of land is a simple matter after a few fundamental principles of the traverse-table are mastered is known to many skippers of boats capable of deep-sea cruising, but only a select few appreciate the ease with which they can become deep-sea navigators. As a result of the Bermuda and Marblehead races and the coming Havana run, there seems to be considerable of an awakening, however, among the coasting boatmen as to the vast area which is open to them if they know how to find their position and keep their course on the ocean roadways.

As instructor of the Yachtsman's Club of Philadelphia in the science of practical navigation, it has been my experience that the man who is busiest through the day is the most eager to find recreation in the evenings by working out the practical problems of navigation. In this series of articles every effort will be made to render the subject easily understood. To some of the more experienced navigators, many of the things explained may savor of the text-book for beginners, but they as well as the beginners and the inexperienced may find the articles valuable. The writer has stuck to the bare instructions in the art of navigation, and anyone who works out the problems as they appear need not hesitate to lose sight of land anywhere up or down the coast.

The only outfit required is a pair of dividers, a pair of parallel rulers, a copy of Bowditch's Tables and the Coast and Geodetic Survey chart No. 8, "Gay Head to Cape Henlopen." The rulers and dividers may be bought to suit the pocketbook. The tables cost $1.25, and the chart 50 cents, and may be obtained from the Bureau of Navigation, Washington, or their agents at the seaports.

NAVIGATION.

Navigation is the art of keeping a ship's reckoning; that is, keeping an account of the direction in which she has sailed, and the distance which she has gone in that direction, in such a manner as to know at all times where she is, and to be able to tell in what direction to go in order to reach any desired place.

This art is almost wholly mechanical, and is quite apart from the science of Nautical Astronomy. The latter subject is an invaluable auxiliary of Navigation, and that is all. Many a navigator has done wonders without any knowledge of Astronomy, but the greatest astronomers could do nothing at sea without a knowledge of Navigation.

The instruments used in Navigation are the following:

THE COMPASS.

This instrument consists of a card firmly attached to a magnetized steel bar, called a Magnetic Needle. This needle has a cup formed on its under side in the form of a hollow cone. The bottom of this conical cup has a jewel let into it, to make a hard bearing. The cap is then placed on the point of a vertical pin, which stands in the center of a circular bowl, a little larger in diameter than the compass card. The bowl is hung in gimbals so as to always remain in a horizontal position when the ship is in motion. There is also a quantity of lead attached to the bottom of the bowl to aid it in "keeping level." The card has the points and quarter-points marked clearly on it. The bowl is painted white inside, and in a line drawn through the center of the compass parallel to the line of the ship's keel, there is a black vertical line drawn on the inside of the compass bowl. This is called the "Lubber's Point." The motion of this point around the compass card shows in what direction the ship is pointing. The compass card stands still on its pivot, and as its bowl is rigidly attached to the ship, the whole ship practically swings around the compass card.

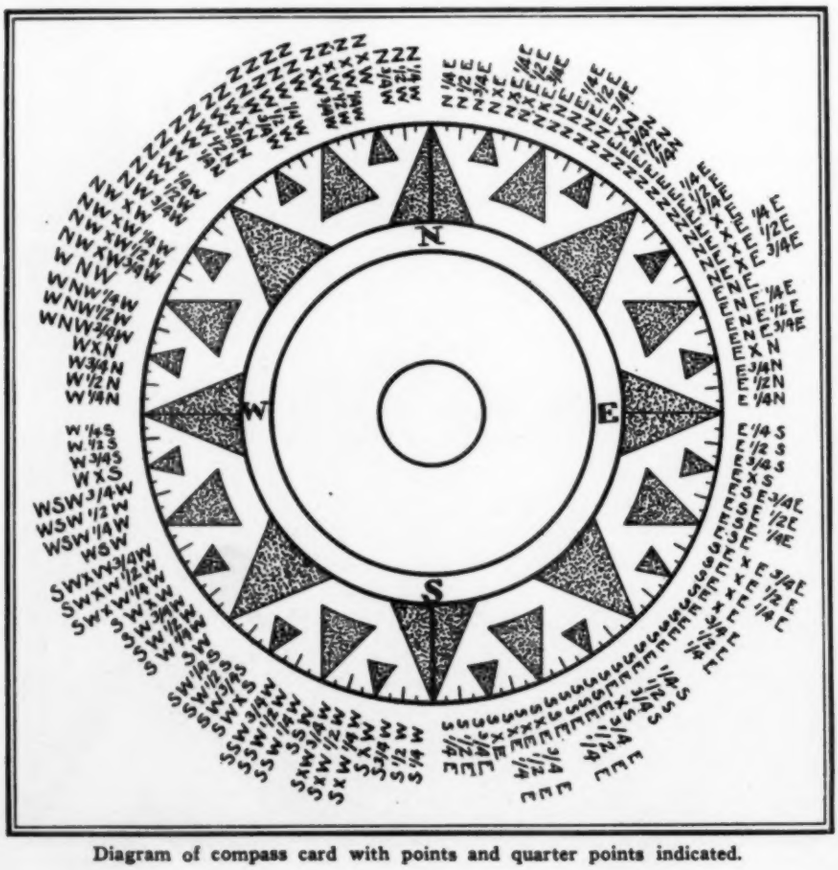


Diagram of compass card with points and quarter points indicated.

THE CHART

The Chart is a map of the ocean, on which the earth is represented as a flat surface. On it are marked the coast-lines, rivers, bays, shoals, rocks, islands, lighthouses, lightvessels, buoys, and all sailing guides. The depth of the sea at all places is marked on it. The meridians of longitude and parallels of latitude are drawn on it, and at convenient intervals compasses are drawn. With the aid of a parallel ruler or a pair of triangles, and a pair of dividers, the seaman can find the direction he must steer by his compass, and the distance he must sail, in order to reach any desired port. He can also plot on it every step of his vessel's movements, and by this means and the information on the chart, graphically see where he is, and any probable danger he may be approaching.

THE LOG.

There are two kinds of logs used in these days on shipboard; the taffrail log and the old-fashioned chip-log.

The taffrail log consists of a registering machine secured to the taffrail, or any part of the vessel's stern, to which is attached a line with a rotating fan on the outside end of it. The fan being towed behind the ship, the ship's speed causes it to revolve, and the line transfers the motion to the taffrail machine, which registers on a dial the number of miles the vessel has gone through the water. The dial is usually marked to register either 50 or 100 miles. Having noticed the reading on the dial at any time, and having made a note of it, the number of miles the ship has traveled may be found at any time by subtracting the original reading from the present one.

The chip-log consists of a triangular piece of wood or a conical canvas bag so made that it will offer sufficient resistance to the water to practically stand still when the line attached to it is let run slack. The log is used with a time glass, usually a 15-seconds or half-minute glass. The line is marked with bits of string with knots in them, placed at regular intervals. These intervals are such that the distance between them bears the same proportion to a nautical mile that the number of seconds run by the glass does to an hour. This has led to the practice of calling a sea mile a *knot*.

THE LEADLINE.

This is a most important instrument to any navigator. Its simplicity often brings it neglect, but the man who does not pay proper attention to it stands a good chance of getting into trouble. A very large percentage of marine accidents and losses can be traced directly to the neglect of the lead-line. As the soundings (depth of water) on the chart when over 18 feet are given in fathoms (a fathom equals 6 feet), the lead-line is marked in fathoms. When a vessel is in less than 20 fathoms of water it is necessary that the depth obtained may be given quickly. To accomplish this a certain set of standard marks have been adopted, so a man who learns the lead-line in one vessel will not have to learn a new one in the next. The colors distinguish the marks in the daytime, and when they are made of different material they can be recognized by the torch at night time. The marks follow:

2 Fathoms—Two pieces of leather.
3 Fathoms—Three pieces of leather.
5 Fathoms—White rag (canvas).
7 Fathoms—Red rag (bunting).
10 Fathoms—Piece of leather with a hole in it.
13 Fathoms—Blue rag (flannel or cloth).
15 Fathoms—White rag (canvas).
17 Fathoms—Red rag (bunting).
20 Fathoms—Two knots (a piece of cord).

At every additional ten fathoms a piece of cord with a knot in it for each additional ten fathoms. The intermediate five fathoms have each a piece of cord with a single knot in it.

On a long passage it is not advisable to always tow the Patent Log; it may get lost; and in a small vessel it is something of a drag. It may also get out of order. In any case, with no patent log the sailor must fall back on the old-fashioned log and glass.

TO MAKE A CHIP LOG.

The Logship is made this way. Get a piece of hardwood about 7 inches by 5½ inches and ½ inch thick. Find the middle of one of the 7-inch sides, and with a pair of dividers, with one leg on this middle point, describe an arc on the other 7-inch side. Draw a line from the middle point to each end of the arc, and cut the wood along these lines and the curve. Bore a hole large enough to take the line in each corner of the logship. Saw a lengthwise slot in the curved side of the ship about ½ inch deep, and put a strip of thin lead in it for ballast. A couple of small nails should be driven through the wood and lead.

Pass the end of the line through the apex of the logship and put an overhand knot in it. About 18 inches from the ship seize a wooden socket firmly to the line. Make a wooden peg about 2 inches long with a hole in the large end of it, and through this hole pass a piece of the logline about 2 feet long and seize the middle of it in the hole. Pass the ends through the other two holes in the logship and put overhand knots in them.

Measure off about 60 feet of the line and put a piece of white rag in it. This is called the strayline, and is to float the logship clear of the stern and the disturbed water of the wake.

From the white rag measure off the length of each knot and mark the line with a piece of string at each length having a knot in it for every length marked off.

To find the length of a knot on the line:

There are 3600 seconds in an hour and 6080 feet in a nautical mile: therefore the knot on the line must bear the same proportion to the mile that the number of seconds the glass runs does to an hour. The first thing to do is "time the glass"; that is, try it several times with your watch to see how many seconds it runs. Then—

$$\frac{6080 \times \text{No. of seconds the glass runs}}{3600} = \text{The length of the knot.}$$

The 6080 and the 3600 will cancel to 76 and 45, and this can be written 1.69; so we have two simpler rules, viz.:

$\frac{76}{45} \times$ the number of seconds the glass runs; or,

1.69 × the number of seconds the glass runs.

Thus for a 15-second glass—

$$\frac{76 \times 15}{45} = \frac{76}{3} = 25' 4'', \text{ or } 1.69 \times 15 = 25' 4.2''$$

BOXING THE COMPASS.

Boxing the compass is a rather difficult subject to learn unless the student first understands the system by which the points are named. It then becomes fairly easy. The student should spare no effort to really master this instrument, as an imperfect knowledge of it will handicap him all through his future work. A good way to master it is to proceed as follows:

Draw a circle with a pair of dividers about four inches or more in diameter. Divide it into four equal parts, or quadrants. Mark these points North, South, East, and West—N., S., E., W. Next divide each of these quadrants in half, and mark the ends of the dividing lines with the letters of the cardinal points between which they lie; thus, N.E. between N. and E.; S.E. between S. and E.; S.W. between S. and W.; and N.W. between N. and W. Beginning at North, your compass now has marked on it, North, North-East, East, South-East, South, South-West, West, and North-West.

The spaces between these eight points must be again equally divided, and lines drawn through the center of the circle to mark the divisions. These points are again named by calling the cardinal and intercardinal points between which they are situated; thus, between North and North-East we have North-North-East, and between East and North-East we have East-North-East. The other quadrants being marked the same way, we now have the half of the compass named.

N., N.N.E., N.E., E.N.E., E., E.S.E., S.E., S.S.E., S., S.S.W., S.W., W.S.W., W., W.N.W., N.W., N.N.W., N.

These divisions may now be again subdivided, and we will then have all the points. These last group, the odd points, are named by calling the cardinal or intercardinal beside which they lie and saying *by* the other *cardinal* on that side of it. The point to the East of North is called North-by-East; the point to the North of East is called East-by-North; the point to the North of North-East is called North-East-by-North; and the point to the East of North-East is called North-East-by-East. Applying this rule to the other three quadrants we will have all the points named. Next proceed to number the points. Remember, a course is the angle the ship's path makes with the North and South line of the compass. For this reason the first point from North or South is marked 1. North or South is marked 0, and East or West is marked 8.

When the points have all been drawn and named, and their numbers marked on them, we can proceed to mark in the quarter points. These are easily named if you will only remember that all the fractions are called from North or South, towards East or West, except the fourth and eighth points, which are called towards North or South.

We are now ready for a table of all the points and quarter points of the compass.

THE POINTS OF THE COMPASS.

0 North	North
1 N. by E.	N. by W.
2 N. N. E.	N. N. W.
3 N. E. by E.	N. W. by N.
4 North-East	North-West
5 N. E. by E.	N. W. by W.
6 E. N. E.	W. N. W.
7 E. by N.	W. by N.
8 East	West
0 South	South
1 S. by E.	S. by W.
2 S. S. E.	S. S. W.
3 S. E. by S.	S. W. by S.
4 South-East	South-West
5 S. E. by E.	S. W. by W.
6 E. S. E.	W. S. W.
7 E. by S.	W. by S.
8 East	West

N. to E.	S. to W.	N. to W.	S. to E.	Pts.	Degrees.
North	South	North	South	0	00°—00′—00″
N. ¼ E.	S. ¼ W.	N. ¼ W.	S. ¼ E.	¼	2 —48 —45
" ½ E.	" ½ W.	" ½ W.	" ½ E.	½	5 —37 —30
" ¾ E.	" ¾ W.	" ¾ W.	" ¾ E.	¾	8 —26 —15
N. by E.	S. by W.	N. by W.	S. by E.	1	11 —15 —00
" ¼ E.	" ¼ W.	" ¼ W.	" ¼ E.	1¼	14 — 3 —45
" ½ E.	" ½ W.	" ½ W.	" ½ E.	1½	16 —52 —30
" ¾ E.	" ¾ W.	" ¾ W.	" ¾ E.	1¾	16 —52 —30
N. N. E.	S. S. W.	N. N. W.	S. S. E.	2	22 —30 —00
" ¼ E.	" ¼ W.	" ¼ W.	" ¼ E.	2¼	25 —18 —45
" ½ E.	" ½ W.	" ½ W.	" ½ E.	2½	28 — 7 —30
" ¾ E.	" ¾ W.	" ¾ W.	" ¾ E.	2¾	30 —56 —15
N. E. by N.	S. W. by S.	N. W. by N.	S. E. by S.	3	33 —45 —00
" ¾ N.	" ¾ S.	" ¾ N.	" ¾ S.	3¼	36 —33 —45
" ½ N.	" ½ S.	" ½ N.	" ½ S.	3¾	39 —22 —30
" ¼ N.	" ¼ S.	" ¼ N.	" ¼ S.	3¾	42 —11 —15
N. E.	S. W.	N. W.	S. E.	4	45 —00 —00
" ¼ E.	" ¼ W.	" ¼ W.	" ¼ E.	4¼	47 —48 —45
" ½ E.	" ½ W.	" ½ W.	" ½ E.	4½	50 —37 —30
" ¾ E.	" ¾ W.	" ¾ W.	" ¾ E.	4¾	53 —26 —15
N. E. by E.	S. W. by W.	N. W. by W.	S. E. by S.	5	56 —15 —00
" ¼ E.	" ¼ W.	" ¼ W.	" ¼ E.	5¼	59 — 3 —45
" ½ E.	" ½ W.	" ½ W.	" ½ E.	5½	61 —52 —30
" ¾ E.	" ¾ W.	" ¾ W.	" ¾ E.	5¾	64 —41 —15
E. N. E.	W. S. W.	W. N. W.	E. S. E.	6	67 —30 —00
" ¼ E.	" ¼ W.	" ¼ W.	" ¼ E.	6¼	67 —30 —00
" ½ E.	" ½ W.	" ½ W.	" ½ E.	6½	73 — 7 —30
" ¾ E.	" ¾ W.	" ¾ W.	" ¾ E.	6¾	75 —56 —15
E. by N.	W. by S.	W. by N.	E. by S.	7	78 —45 —00
" ¾ N.	" ¾ S.	" ¾ N.	" ¾ S.	7¼	81 —33 —45
" ½ N.	" ½ S.	" ½ N.	" ½ S.	7½	84 —22 —30
" ¼ N.	" ¼ S.	" ¼ N.	" ¼ S.	7¾	87 —11 —15
East	West	West	East	8	90 —00 —00

Table of the points and quarter points of the compass.

Flags--Their Forms and Functions.

The Various Flags and Pennants With Which a Motor Boat Should Be Equipped. Where They Should be Displayed and Upon What Occasions.

By M. D. Gannon.

THE understanding of the significance, the proper position and time of display of the various flags flown by motor boats and yachts, is an important part of the yachtsman's education, as these symbols often supply his only means of communication with those on shore, or with other vessels at sea.

With the advent of so many motor driven cruising yachts have come a number of requests for enlightenment on this subject, and it is in answer to these requests that this article is written.

The old saying, "A yacht is known by the flag she flies", gives evidence that time honored custom and etiquette have decreed certain shapes and sizes for all flags, and that certain rules must be followed in order properly to display them. It is from a knowledge of these rules that one learns the particular meaning of each flag, and to be able to read at a glance the message it is meant to convey.

The flag equipment of all yachts should include, besides those flags known as "colors", the Union Jack, absent flag, owner's and crew's meal pennants, church pennant, night pennant, and the International Code flags, numbering twenty-seven (27), one flag for each letter of the alphabet and the answering signal. The "colors" consist of the yachting ensign, the club burgee, the private signal, and, if the yacht be a flag ship, the flag officers' pennant.

The display of flags on motor boats follows the custom obtaining on larger vessels, modified to conform to conditions on boats, which may, or may not be provided with masts. Almost every motor boat from the little sixteen footer up, is supplied with bow and stern flag staffs, and these will afford opportunity to display all the flags that should be shown at any one time. Under no circumstances, however, should any two of the flags known as "colors" be flown from the same staff, mast or signal arm.

All yachts carry the ensign of the country to which they belong. The United States yacht ensign has thirteen (13) stripes, alternating red and white, with a rectangular blue field, containing a foul anchor, encircled by thirteen (13) white stars. This design was approved by the Secretary of the Navy, August 7, 1848.

The club flag, or burgee, as it is more generally known, represents the club of which the boat's owner is a member. It is usually triangular in shape, the hoist being two-thirds of the fly; that is, the base of the triangle should be two-thirds of the distance from the base to the apex.

The private signal designates who is the owner of the boat or yacht. It may be swallowtail, rectangular or triangular in shape, but custom now favors the use of the swallowtail flag, its hoist being two-thirds of the fly, and the width of the swallowtail, one third of the fly. Each owner's private signal should be of a different design, and it is desirable to have this design registered with your club secretary, so as to avoid the likelihood of the same design being used by more than one yacht owner.

The flag officers' pennants designate the rank of the officers. They are usually rectangular in shape, and are displayed in lieu of the private signal. Some clubs have adopted designs from a combination of the club burgee and rank insignia, but the following colors are more generally used and readily recognized: For Commodore, Blue flag, showing foul anchor, encircled by thirteen (13) white stars; Vice Commodore, Red flag, design in white; Rear Commodore, White flag, design in red or blue; Acting Commodore, plain blue flag; Fleet Captain, White flag with blue foul anchor.

The ensign is always displayed at the rear mast, pole or staff of the yacht. Small sailing yachts with one mast carry the ensign at the main peak when under way, and at the taffrail staff, when at anchor. The same rule applies to motor boats or yachts; but if the bow staff is the only available place from which to fly a flag, the private signal is shown when under way, and the club burgee when at anchor, except in case the owner is a flag officer. Any owner who holds the rank of Commodore, Vice Commodore, Rear Commodore or Fleet Captain should always display the flag designating his rank at the bow staff, in place of either the club burgee or private signal, except when he may be cruising with another club of which he may be a member, but not an officer. In yachts equipped with one mast and bow staff, the club burgee is displayed at the bow staff, and the private signal at the mast-head. Larger yachts provided with two or three masts fly the club burgee and private signal at the fore and main mast-heads respectively, and the ensign at the mizzen mast-head, instead of the stern flagstaff. The ensign is always hoisted, that is, sent aloft just as it unfolds when "bent on" the halliards, while the club burgee, private signal, officers' pennants and other flags are sent up "in stays" and broken out when the mast-head is reached.

The Union Jack is a blue rectangular flag with white stars, one for each state in the Union, and is displayed upon yachts when at anchor in port, on a Jack staff, or other suitable place at the bow. It is also set on Sundays and on all other formal occasions, or whenever displayed by the flag ship of the fleet. While under way, it is rarely shown, except when participating in a marine parade or similar event.

The small motor boat does not afford a suitable place for the display of either the absent flag, owners' or crews' meal pennants, as they are properly shown at the end of the main spreader on single masted boats, and are never hoisted to the mast-head or the top of a flag staff.

The owners' absent flag is blue and rectangular. When hoisted, while at anchor, at the main starboard spreader, it signifies that the owner is not on board; however, it should be hauled down the moment he comes on deck.

The owner's meal pennant, or dinner flag, is white and rectangular, and as its name signifies, denotes that the owner is at meals. This flag, like the crews' meal pennant, is only displayed while the yacht is at anchor, and prospective visitors should time their visits on board so as not to interrupt either the owner or crew while eating. It is hoisted at the main starboard spreader, and after sunset a white lantern is substituted.

The crews' meal pennant is a red triangular flag; when displayed it signifies that the crew is at meals.

The church pennant is seldom displayed, as it is only hoisted during Divine service on board a yacht, while at anchor. It is a pointed white flag with a blue cross, and is the only flag ever displayed above the ensign.

The night pennant is a narrow blue flag, which is hoisted at sunset to the main mast-head, and flies from sunset to colors.

If fancy so dictates, a United States pennant may be flown from the main truck, when the yacht is returning to home waters from a cruise to foreign ports.

The official day on board a yacht begins with colors at eight o'clock A. M., and ends at sunset, when the ensign is hauled down and the night pennant sent aloft. The time for hauling down colors is always taken from the senior officer present, or when in company with a vessel of the United States Navy, or at anchor off a United States Naval Station, the time is taken from such vessel or station.

The flags of the International Code furnish the means of communicating with any vessel at sea, whether in navy use, commercial use, or yachting, as the flags and their meanings are identical. Many codes for signalling have been arranged by attaching different meanings to various combinations of two or three flags. The navies of the world, as well as commercial vessels have a distinct code while the leading yacht clubs have adopted one known as the "Yachting Code" which is much simpler in form than either of the other two, as its general requirements are for signalling during regattas and club cruises. The "Yachting Code" consists chiefly in sentences needed by the vessels of the fleet, which are not to be found in the International Code, and includes General Signals of one letter; Special Signals of two letters; Days of the Week Signals of two letters; Hours of the Day Signals of two letters; Squadron Formation Signals of two letters; Names of Places Signals of two letters; and Compass Signals of three letters.

The flags of the International Code are also used for decorative purposes, the particular one being that of "dressing ship," to which is is specially adapted. The largest yacht ensign, with which the yacht is equipped is displayed at the peak or staff aft, and the Union Jack is hoisted on the Jack staff forward. A rainbow of flags is then stretched from the water line forward to the water line aft, by way of the jib boom end to the fore top mast-head and down to the end of the main boom, allowing two or more flags to hang down to the water line, fore and aft; the line being kept taut by a weight hung on each end. Care should be taken to have the pennants, burgees and rectangular flags bent on the line alternately, though the owner can carry out his own ideas as to the arrangement of colors. The ceremony of "dressing ship" is particularly apropriate on the day of the annual regatta, the Fourth of July, while participating in a parade headed by United States naval vessels, or when your club has been honored by a visit of the fleet from a neighboring club.

The yacht ensign also has its own particular uses in signalling for help when in distress, and in answering or making salutes. When the ensign is displayed upside-down, that is, with the field at the bottom, it is universally recognized as the signal of distress, and its call for assistance to those who may see it, is equally as potent as the "S. O. S." of the wireless telegraph. When in making or answering a salute, dip the ensign once, and only once, as the tooting of whistles or discharging of a gun, is not considered as being in good form. The rules governing yacht routine, as adopted by the leading clubs, provide that all salutes should be answered in kind, but you cannot offend by following the above suggestions.

On Decoration Day, and other occasions of National mourning, the ensign only should be half-masted. On the death of the owner of the yacht, both the club flag and his private signal should be half-masted, but not the ensign. When mourning is ordered for a member of the club, the club burgee only should be half-masted. The above rules apply to yachts, whether under way or at anchor. In half-masting a flag, the flag should always be hoisted to the mast-head and then lowered to position at half-mast, and when lowering, should be raised to mast-head, and then hauled down. But any time, whether hoisting or hauling down the ensign, its folds should never be permitted to touch the deck, while being "bent on" or detached from the halliards.

Talks With Our Naval Architects.

Norman L. Skene.

NORMAN L. SKENE was graduated from Massachusetts Institute of Technology in 1901, receiving the degree of S. B. in naval architecture, and in 1902 he wrote the "Elements of Yacht Design," a treatise that has met with considerable popularity, being now in its second edition. In 1903 he established himself in business in yacht architecture and is now located at No. 14 Kilby Street, Boston.

Mr. Skene's business has run mostly to motor craft and he has designed many successful yachts of all types. Among his best known ones maye be mentioned Ariadne, Javelin, Mahdeen, Waubesa, Nootka, Black Hawk and a number of others.

In speaking of his business in designing yachts and various other chaft, Mr. Skene said: "The design of a yacht or any other vessel is primarily an engineering problem. There is, however, an aesthetic side to this problem which is too often hastily run over and there is rarely enough attention paid to it. This phase is an obscure one which cannot be worked out mathematically as can such concrete things as displacement, time, speed and other functions of the design or structure. A pleasing appearance is highly desirable in a vessel, particularly one which is to be used as a yacht for extensive cruises."

In considering the aesthetic side of the design, Mr. Skene holds that three principles should be observed, namely the utility, symmetry and harmony. "A designer should not work any feature into a design," he said, "which he does not believe to be beautiful and know to be useful. Every portion of the design must be for some useful purpose or else the principle of utility is violated. Nothing can give a permanent impression of beauty which is not useful as well.

"Symmetry is exacted by the laws of nature in a large measure. Both sides of the vessel must be alike. The bow must have about the same buoyancy as the stern and the weight must be arranged symmetrically or the vessel will be unseaworthy. There are many less obvious ways in which the principle of symmetry must be observed.

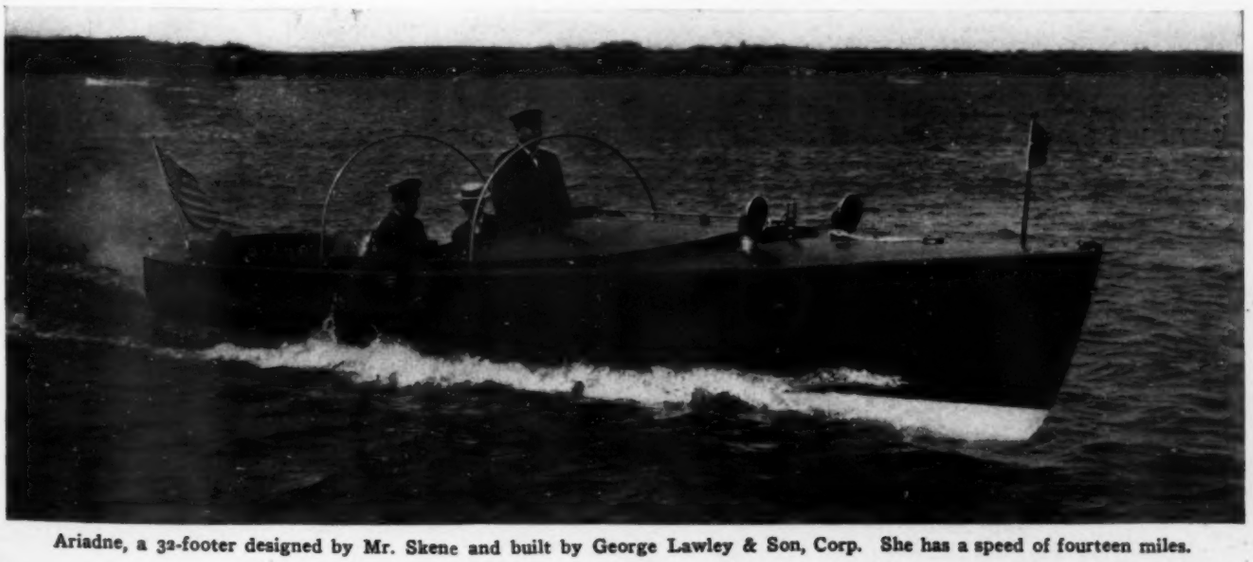
Norman L. Skene, Naval Architect.

"By harmony I mean the blending of the various features into a perfect design in which no one feature is at variance with the character of the others. A client of mine had the idea of harmony and he said tritely that 'some boats had Queen Ann bows and Mary Ann sterns.' This principle of harmony is more sinned against than any other.

"The three first principles alluded to above are easily understood in a general way, but their application can be successfully made only by one of considerable experience and of native artistic ability. A thorough understanding of the aesthetic side of yacht design differentiates the real yacht designer from the dabbler and the imitator."

Speaking of some of the possibilities for motor boat development, Mr. Skene said: "I believe that the combustion engine has not been developed to the ultimate type as yet, by any means. I am in touch with some new designs and engines now being worked out that will command attention of the engineering world. One of these, a gasoline engine, is self-starting and reversing, being pneumatically controlled by a single small lever located in any part of the boat desired. This motor is self-lubricating, requires no attention and is comparable with an electric motor in its simplicity of control. All other reversing engines are manipulated at the engine with a complexity of levers.

"Another new design which I have in mind and which seems eminently practical is a multiple expansion gas engine, either compound or triple, which divides the fuel consumption in half. This engine will use any form of fuel, and the employment of gas stored under pressure in tanks, similar to soda water, is contemplated. The use of such fuels more than doubles the cruising radius of any craft with a given tankage, and such possibilities point to great things for motor boating in the future."



Ariadne, a 32-footer designed by Mr. Skene and built by George Lawley & Son, Corp. She has a speed of fourteen miles.

Havana Race--Developments to Date.

New Boats for the Big Ocean Contest, Their Plans and Descriptions. Other Boats That Will Compete. The Situation in General.

By Chester L. Wynn.

RACES, of course, are only incidents in the yachting life of a season, but more than ordinary interest is being attached to the ocean race which will take place next month from Philadelphia to Havana. The Eastern yachtsmen are assured of a race which will be a test of skill in the use of the compass, dead reckoning and chart work and one which should hold the interest of motor boating enthusiasts the world over. It will be the maiden race for many of the boats, and the 1,300 mile run will no doubt give a full test of their merits.

At the time of writing, in mid-March, only five formal entries have been made, but the committee in charge of the race is confident that at least nine power cruisers will put off from Race Street wharf, the start, at 12:30 o'clock, on May 21.

The Bermuda and Marblehead races have taught their lessons, and the details of this run have been worked up with every regard for a safe passage by the race committee, which is composed of Commodore J. G. N. Whitaker, of the Yachtsmen's Club of Philadelphia; Commodore Carlos F. Carbonell, of the Havana Yacht Club and Thomas Fleming Day. A regatta committee to pass upon the suitability of the entries for the race has been appointed as follows: William B. Sterns, Boston; Thomas D. Bowes, and James M. Dodge, Philadelphia; Charles D. Mower, N. Y., and R. M. Haddock, New Rochelle.

The Yachtsmen's Club, which will be the host of the visitors at the starting point of the race, has entered into the spirit of the contest with vim. The club has offered prizes to the amount of $3,500, which will be proportioned so that the winner will receive a $1,000 cup and $1,000 in cash; the second over the line will be given a $500 cup and a $500 cash prize, while the third will receive $250 and a cup of like value. The city officials of Philadelphia are working in conjunction with the Yachtsmen's Club, and a resolution has been introduced into City Councils appropriating $2,000 as the municipal donation to the winner.

The conditions of the race are not exacting except in reference to the safety of the crews, and are very similar to the conditions of the Bermuda races. Suitable appliances for any emergency must be carried and stores and water supply sufficient for at least 30 days must be on board.

There will be at least three Philadephia boats in the race. Commodore Whitaker's Ilys, which gave such a good account of herself in the last Bermuda race; a new 60-footer, the Caliph, owned by Commodore M. E. Brigham, of the Ventnor Yacht Club, and the Georgiana II, owned by William Griscom Coxe. Lack of condition of the crew probably cost the Ilys the Bermuda race, and one of her crew, Charles Lagen, when he heard of the Havana race gave some valuable advice to the yachtsmen. He is going to be on the Ilys in this race and tips the other sailors off as follows: "All the racing men should go into training for the severe race just the same as they would for any athletic contest. If the Ilys wins this race it will be because of the complete training of the men going on her."

As a result of this advice and the recollection of former experiences, the Lady Maud, the power cruiser owned by ex-Commodore Christopher S. Street, of the Yachtsmen's Club, went into commission on March 1, as a training ship for the men who will man the Ilys, Caliph and Georgiana II in the race. Captain B. D. Reese, who as teacher in practical navigation at the Yachtsmen's Club during the past winter, has drummed star and sun sights, the working of the chronometer for longitude, compass deviation and steering, into the boys until they feel like old salts, has had charge of the navigation of the Lady Maud on her runs past the Delaware Breakwater to the ocean, and the crews are getting into good condition for the race.

Another formal entry for the race at the time of writing is the 65-foot raised deck cruiser Caroline, owned by M. Frank Dennis, of New York. The Caroline showed considerable ability as a racer last season and had a cruising record of 6,000 miles. Her cruising grounds were from the coast of Maine to the Chesapeake Bay, and she was thoroughly tested in all manner of weather. This will stand her in good stead for the Havana race.

A 25 horsepower Standard engine supplies her power. Mr. Dennis will be one of the crew of the Caroline and she will be navigated by Walter M. Bieling with Fred Thurber as mate. Some changes are being made. Her spars will be changed from the light signal mast to a couple of heavy spars, stepped on the keel and secured by shrouds. Life lines will run her full length and some addition provision will be made for better ventilation. Two fisherman's dories will replace the regular complement of boats.

Commodore Whitaker's Ilys has had a complete overhauling and was given a thorough trying out in the Delaware Bay during the past month. Only a few changes from her last year's racing trim have been made in fitting her out for the coming race.

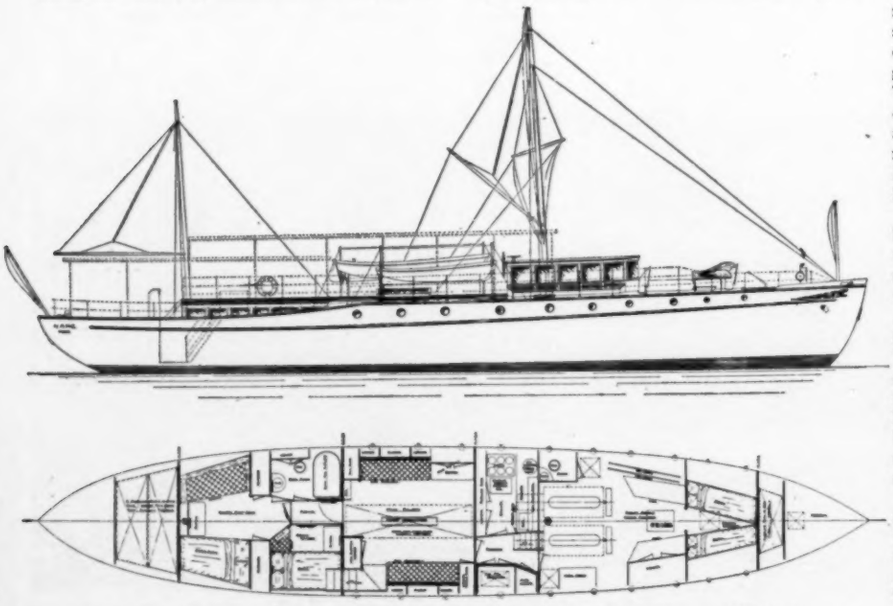
The Ilys was designed by Thomas D. Bowes and is 50 feet 3 inches on deck, 47 feet 8 inches on the waterline, 10 feet 6 inches breadth at deck and 3 feet 3 inches draft. She has a nearly plumb stem and a raking Normand V stern and has considerable dead rise, especially aft. Forward the boat has a raised deck on sections that are quite sharp with an extreme flare and flam above the waterline. The raised deck extends aft to the engine room bulkhead and on it is a small trunk cabin which takes the place of the usual skylight and hatch. This cabin has air ports in the sides and in the forward and after bulkheads. Through these ports the Ilys has the advantage of being able to have her engine room and galley ventilated when the ordinary skylight would have to be closed.

The Ilys's engine is a Hall of 25 horsepower and built by the Hall Gas Engine Company, of Philadelphia. It is of the 4-cylinder, 4-stroke type with both valves mechanically operated. It gives its rated power at 600 r.p.m. In the coming race it will be timed to run at about 480 r.p.m., at which speed it will develop about 20 horsepower. The intake pipe on the engine is forked with a carbureter placed on each end of the fork. In this way one carbureter and gasoline line can be cleaned while the other is supplying gas to the engine.

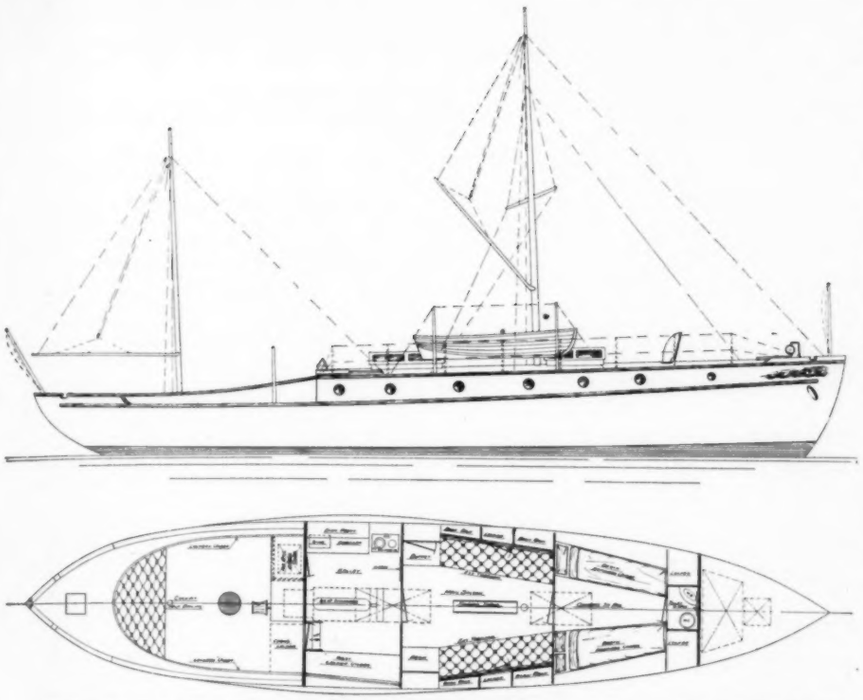
Some slight changes, the results of Commodore Whitaker's experience in the Bermuda race last year, have been made in the equipment of the Ilys. She has had a Nicholson self-recording ship log and a Warner tachometer installed and will carry a jib and gaff headed storm trysail of special material. The engine room will be in charge of Theodore Presse as chief, and Maurice Belknap as assistant. Captain B. D. Reese will be mate and the deck crew will consist of Thomas D. Stellwagon, Charles L. Lagen and R. F. Shackleford.

The Georgiana II, which has been entered by Mr. Coxe, was designed for ocean racing with an easy bilge, good freeboard, well-immersed propeller and a high turtle deck forward. She was designed by her owner and A. M. Main, naval architect, and was built at the Harlan and Hollingsworth yards at Wilmington. She has been tried out in all manner of weather and has proven a good sea boat, especially in head seas. Her overhanging stern, although rather short, gives her added buoyancy in a following sea and does not cause pounding. She is fitted with two masts and has inside ballast.

The gasoline tanks built into the boat have a capacity of 500 gallons, but auxiliary tanks will be carried on the Havana run. The motive power consists of a 60 h.p., 4-cylinder, 4-cycle engine which makes 400 r.p.m. The cylinders are 8¼ inches bore by 9 inches stroke. She has a large three-bladed pro-



Edamena, the new 75-foot, heavy-weather cruiser designed by Messrs. Whittelsey.



Eolis, the 50-footer designed by Whittelsey and Whittelsey, and recently completed, has already proved her worth.

peller, 30 inches in diameter of solid bronze. Her speed is 14 miles per hour.

The engine room is just aft amidships and is entered from the after quarter deck. The hull of the vessel under the engine and the engine room bulkheads fore and aft are protected with sheet metal so as to prevent rapid spread of fire if it should break out in the bilges. On the starboard side is a storeroom and in the after peak are the gasoline tanks shaped to the form of the vessel. Access is had to them by a brass watertight scuttle on the quarter deck. The tanks are filled from the deck and are provided with the necessary pipes, of solid drawn copper, to the engine room and to the air.

On the forward end of the bridge deck just aft the raised turtle back and extending above it about 2 feet is a strongly built breakwater. On the port side behind this breakwater the companionway to the main saloon is placed and across the center are lockers for flags, horns, etc. The breakwater turns aft on both sides of the boat for 7 feet in the form of a bulkhead and makes a very snug navigating deck, affording protection almost 4 feet high. Here is the brass steering column and telegraph to the engine room while on the foremast is a mechancial indicator showing the direction in which the engine is turning.

The fifth formal entry is the 73-footer Loantaka. This boat was designed by Thos. D. Bowes, now of the firm of Bowes & Watts, and was built by Hiram Weller's Sons, at Trenton, where she was launched last season. The object in the design of this yacht was for a cruiser of moderate draft of the tramp steamship type, capable of standing heavy offshore work. The dimensions of the boat are as follows: Length over all, 73 feet; beam, 14 feet; and draft 4 feet 6 inches loaded. She has the raised deck for and aft, characteristic of the tramp steamer, the deck house having the centers sunk just enough to allow for the deck being the right height for a seat all around inside. With the exception of three small ventilating trunks amidships and one on the after deck, there is no over superstructure. The engine room is situated amidships and contains a six-cylinder, 40 horsepower engine, gasoline tanks, electric lighting outfit, and compressor for refrigerating plant, and separated from the quarters fore and aft by watertight bulkheads.

Loantaka has the straight stem and overhanging stern of the steamship, carries two masts capable of a considerable spread of sail and should be thoroughly at home in any condition of weather which she is likely to encounter. Complete plans and further description of her will be found in the November issue of MOTOR BOATING.

Of the new boats the only one thus far entered is the 60-footer Caliph, which had her finishing touches put on last month by the J. H. Mathis Company, at Camden, N. J., and which is now being tried out for the race. Commodore Martin E. Brigham, her owner, will be her master in the Havana race and P. P. G. Hall, head of the Hall Gas Engine Company, will have charge of her engine room.

The Caliph is 60 feet over all, 11 feet 6 inches breadth on deck and 3 feet 6 inches draft. Her engine room has been placed nearly amidships in order to give the greatest possible room. A 36 h.p. engine, built by the Hall Company, has been installed. It is of the same type as that in the Ilys but instead of being a 4-cylinder type it has 6 cylinders.

She has a nearly plumb stem and a raking Normand V stern. She has considerable dead rise aft and the forward sections, although quite sharp, have been kept full enough as to under water displacement to keep her from burying. A raised deck on the forward part of the boat extends aft to the after bulkhead of the engine room. On this is a small, low trunk cabin in place of a skylight and hatch, with ports on the side and at the forward and after bulkheads, so that the main cabin can be ventilated.

The bridge of the Caliph is directly over the engine room and here are located the steering gear and engine controls. A large funnel, which adds considerably to the appearance of the boat, and two ventilators have also been placed over the engine room. A large mast has been stepped at the forward edge of the bridge so that a good sail spread can be carried. Just aft the cabin and forward of the steering gear has been placed a 10-inch compass which will be used for navigating and steering in bad weather, and the forward compass, a 5-inch one, will be used for steering only. Much care has been exercised in the construction of the boat in keeping all steel and iron outside a large radius around these compasses.

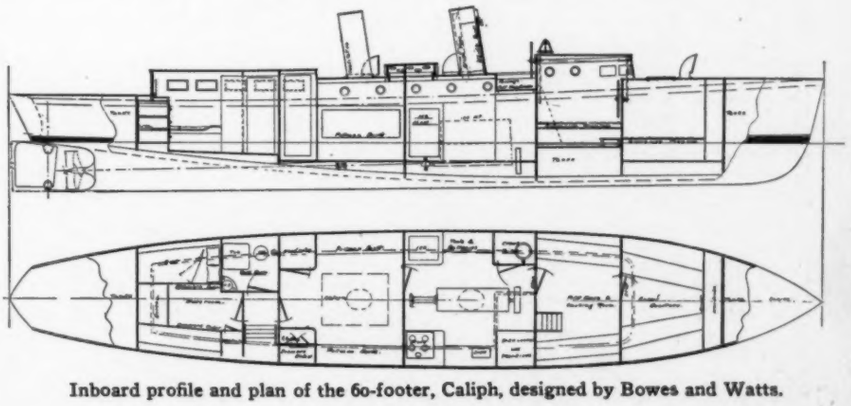
Another boat that is attracting considerable attention is the 75-footer Edamena, a boat designed by Messrs. Whittelsey & Whittelsey for Mr. E. P. Charlton.

She is a heavy ocean-going cruiser with high freeboard and deep draft, which, in fact, is a credible feature of most of the Whittelsey designs, as this firm has never been content to sacrifice seaworthiness for any minor consideration. She is powered with two heavy duty 50 horsepower Standard engines and carries a low yawl rig. She has a deep middle body, a powerful bow, with strong flare, and fine after-body, which is characterized by the entire absence of any shoulder. The keel line is straight with a slight drag and is cut up forward and aft. Outside lead ballast is bolted to the keel, and its area, dead wood, etc., have been carefully balanced to insure the boat's maintaining a true course in heavy weather.

As will be seen by the accompanying profile and plan, the boat has a raised deck continuing in a trunk cabin aft, which is characteristic of a number of the boats designed by this firm. The pilot house is heavily constructed, which is true of all hatches and skylights, particular care being taken to insure watertightness. She carries real spars and rigging and withal is a boat capable of withstanding any weather.

Another boat by Messrs. Whittelsey which, in all probability, will be entered in the Havana race is Eolis, recently completed by the Stamford Motor Company for Mr. J. B. Henderson, Jr., of Washington. Her dimensions are, 50 feet over all with a beam of 11 feet and draft of 4½ feet, which seems liberal in the light of many of the shallow draft designs that are being turned out nowadays. She also is of heavy construction and carries outside lead ballast, and the form of her hull, which is shown herewith in outline, is similar to that of Nereides II, which took part in last year's Bermuda race.

Mr. Henderson is associated with the Smithsonian Institute and expects to use Eolis extensively for scientific deep sea dredging, which will require her to be out continuously in all kinds of weather. Her maiden trip was made from New York to Norfolk at the time of the recent heavy gale.



Inboard profile and plan of the 60-footer, Caliph, designed by Bowes and Watts.

To Be Seen At the Chicago Show.

The Outing Boat Company, Ashland, Wis. The exhibit of this company will consist principally of a number of models of various kinds of boats, the most important of which are a 16-foot Sportsman's Special, selling at $147.50; an 18-foot standard type, selling at $275, a 21-foot cypress model, selling at $550 and a 24-foot runabout, selling at $600. In addition to these, they will also exhibit a full line of the Holter Skis, which are manufactured by this company. We show herewith a cut of the 24-foot Outing Runabout, which is one of the most popular boats turned out by this factory.

Holliday Engineering Company, 749 Bunker Street, Chicago. This company will show a single cylinder motor, having a bore of 3½ inches and a five inch stroke, which develops 2½ horsepower. This engine weighs but 175 pounds and was built to supply the demand for a 4-cycle engine of an inexpensive and yet efficient type. Another type will be a 2-cylinder, 5 horsepower motor, having a bore of 3½ inches and a stroke of 5 inches, equipped with a reversible propeller outfit or a reverse gear in a self-contained base. The 1910 Fishermen's Special Outfit, also shown, is a one-cylinder, 7 horsepower, 4-cycle heavy duty engine, equipped with either make-and-break or jump spark, and has been constructed for purposes where hard and continuous service is desired. This is a slow speed engine, running at about 350 r.p.m. and has a number of special features, which are described in another column. Other engines shown will be a 4-cylinder, 20 horsepower motor of the regular type, equipped with mechanical oiler and Schebler carbureter; also a 4-cylinder, 30 horsepower engine, in addition to a full line of Holiday Reverse Gears, which are built upon a new principle. An expansion ring is used in these gears which, in coming forward, locks all the gears in mesh and therefore does away with motion on the part of the gears in forward speed. In reverse, the gears are set into motion by a planetary system.

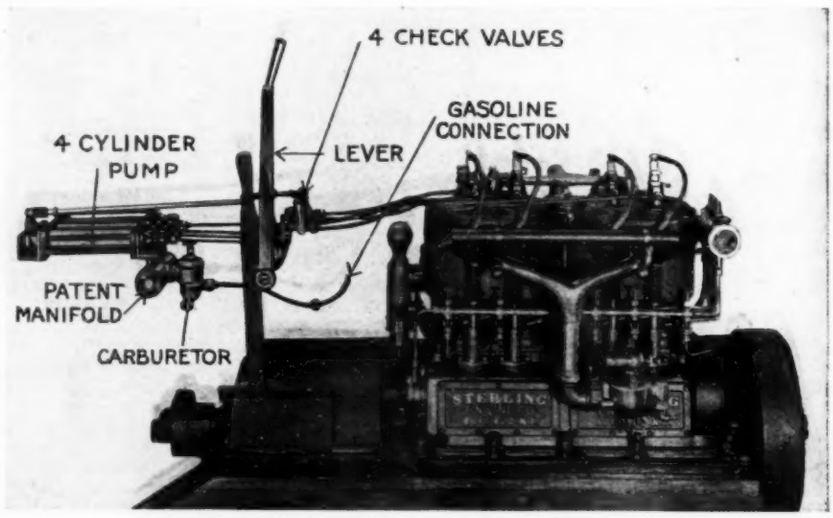
Legnard Brothers, Inc., Waukegan, Ill. Both the Auto Marine and the Legnard Spark Plugs will be shown by this company. The Auto Marine Spark Plug is said to produce as hot a spark as any plug constructed and is as near soot and oil-proof as possible. By a quarter turn of the insulated handle it is possible to remove both points, when they may be cleaned, tested and returned while the engine is running, without danger of shock and without the use of tools. A special non-corrosive wire is used in these plugs which will stand a very high temperature without disintegrating. The Legnard Special Magneto Spark Plug, which is also shown, is made especially for both high and low tension magnetos and comes in three sizes, the A. L. A. M. Metric and Standard Half Inch.

Pfanstiehl Electrical Laboratory, North Chicago, Ill. A full line of magnetos, coils and distributors will be displayed by this company, upon a specially constructed display board, containing their vacuum flash sign. The magnetos are of the high tension type and are self-contained, having the winding under the magnets, an arrangement which permits of better insulation, a proper balance and larger windings, giving greater efficiency at low speeds and cutting down the burning of contact points. The magnets are composed of a triple set of double laminated magnets, and the entire construction is mounted upon ball bearings. The coils shown are constructed with the Pfanstiehl Patented Winding, which permits a caterpillar flame, perfect insulation with lack of electrostatic capacity and a vibrator having perfect synchronism at high speed, with a simple and trouble-proof adjustment. Iridium is used in the contact points, and they are specially constructed to prevent sticking.

The majority of the exhibitors at the Chicago Show were at either the Boston or New York Show and their exhibits were described in our February or March issue. The exhibits described here are those of the companies who were not at either New York or Boston.

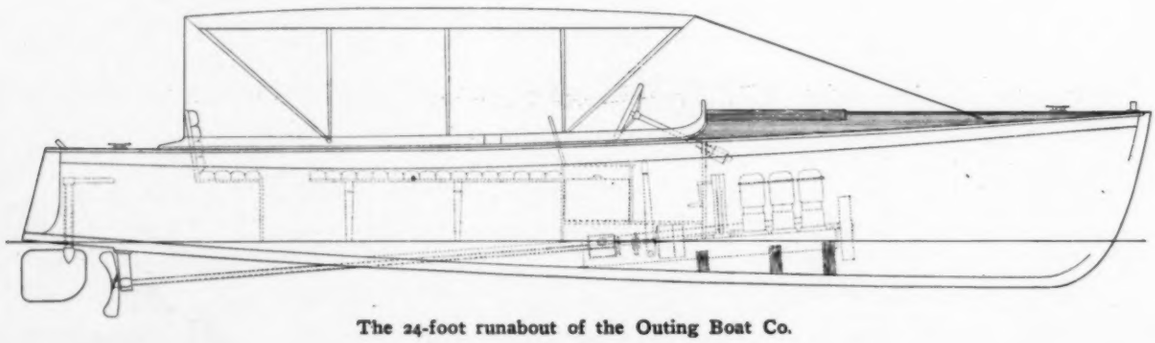
The Knoblock-Heideman Mfg. Co., South Bend, Ind. This company will show a complete line of ignition dynamos, magneto generators, etc., of many different sizes. The newest product which they will exhibit will be the "Quick Action" one-piece battery connector, which is made of one piece of annealed copper, having the attaching ends ribbed to provide stiffness and having the opening in the form of a slot, making attachment to the battery post easy and quick. These connectors are very low in price and are covered with a white covering, allowing the name of the dealer to be printed upon them if desired. The rest of the exhibit of this company will consist of spark coils, spark plugs, switches, etc.

Automatic Starter Company, 1355 Michigan Boulevard, Chicago, Ill. This company will show a practical automatic starter for gasoline engines, which is guaranteed to start any 4 or 6-cylinder engine instantaneously. The starter consists of four or six, according to the number of cylinders, small brass pumps attached to a patent mixing valve and carbureter and the latter is connected with the gasoline tank on the boat. The gasoline, in running through this mixing valve, is vaporized, and by means of a lever the correct mixture of gas may be pumped into copper tubes, one of which runs to each cylinder of the engine. When this mixture is ignited by means of the spark, the engine will start under practically any conditions. This starter weighs but twelve or fifteen pounds and can easily be attached to any engine without touching any part of the mechanism.



The "Automatic" Starter applied to a Sterling Engine.

Pierce Motor Company, Racine, Wisconsin. This company have not shown in any other boat show, but have taken a large space in this exhibition and will exhibit, as a feature, their new model of 22-foot express type launch which has been developed by them this year. They will also have on exhibition a 14-foot dory and a 16-foot launch. In addition to their exhibit at the Armory, there will be shown by their Chicago agents, at 1716 Michigan Avenue, a 15-foot open boat and an 18-foot launch which, in connection with their exhibit at the show, will illustrate the complete line manufactured by this company. An illustration of the 22-foot express launch is shown herewith.



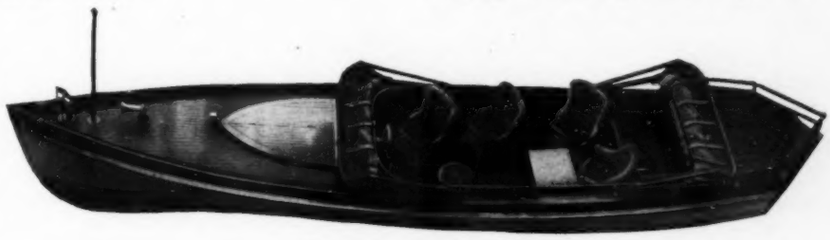
The 24-foot runabout of the Outing Boat Co.

22-foot express type launch of the Pierce Motor Co.

Chicago Boat and Engine Company, 1508 Michigan Avenue, Chicago, Ill. The exhibit of this company will include a complete line of Ferro and Sterling engines, the Inland Lakes Boat Company's boats, reverse gears and other motor boat accessories. An interesting feature will be a display board showing the different parts of the Ferro engines, disassembled in order to show their strength and durability. In addition to the 1909 improvements upon these engines, such as the offset cylinder, adjustable bearings, positive pressure oiling system, etc., other refinements have been added which are said to increase the power of the 1910 model from 15 to 20 per cent. A decrease in weight has also been made of all parts which are not subjected to any particular strain.

W. M. Ryan Company, 314 S. Canal Street, Chicago, Ill. This company will make their first appearance on the market with three types of the Shortt Internal Combustion Engine, of which they are the manufacturers, and a cut of which will be found on page 48 of this issue. The engines shown are a single cylinder, 2½ horsepower, a double cylinder, 4½ horsepower and a double cylinder, 10 horsepower, which are new in principle, being a type of two-cycle, scavenging engine. It is claimed that these have many advantages, the principal among which is the absence of cams, carbureter and heavy valve gears. Combustion is maintained because of the fact that fuel is forced directly into a cylinder which has been scavenged of all burned gases, by a charge of pure air compressed in the crankcase. Since there is no gas compressed in the crankcase, no back firing is possible and there is a power stroke for every revolution. In addition, the company will show a sectional view wash drawing, of large size, as well as working drawings of their engine.

Hankscraft Company, 1220 Michigan Avenue, Chicago, Ill. We show herewith a photograph of the 30-foot Hankscraft boat which will be exhibited by this company. The cockpit of this boat is finished throughout with mahogany and is equipped with carpet, wicker chairs and leather cushions. The aft seat and deck are luxuriously upholstered in leather, and a Pullman type of table with a handsome candelabra electric lamp, gives the boat an unusual touch of luxury. The power plant consists of a four-cylinder, four-cycle, Hankscraft motor, equipped with Bosch Low Tension Magneto and a high tension Duplex Coil.



The 30-foot Hankscraft.

Geo. B. Carpenter & Company, 200-208 S. Water Street, Chicago, Ill. These marine outfitters will exhibit a complete line of marine hardware and supplies, including boat fittings, propeller wheels, reverse gears, lighting outfits, etc. Their 1910 marine supply catalog, a book containing over 450 pages, will be distributed. This catalog, in addition to a complete line of marine accessories, contains about 50 pages of excellent advice for the yachtsman, such as the art of tying knots and making splices, rules for navigation, a glossary of nautical terms, and complete instructions for the installation and operation of the gasoline marine engine, with a description of engine faults and how to locate them.

The motor is started in the usual Hankscraft manner, by a simple push and turn of the steering wheel. Control levers are placed upon a dial in the center of the wheel. Gasoline is carried in a fireproof compartment, and the carbureter is above the waterline and provided with a copper jacket. As further safety protection, the boat is equipped with reinforced air compartments, both forward and aft. This year the Hankscraft Company are offering for the first time Hankscraft Controllers for sale separate from the boat.

The Prize Contest in Questions and Answers.

ON THE following pages—38, 39, 40 and 41—appear the discussion raised by the three questions which we printed in the February issue. We consider these discussions among the most interesting that have been brought out by our contest. They show that a good deal of thought has been given to the various points involved and that the conclusions arrived at are based very largely on practical experience. True, there is no great unanimity of opinion, but this fact contributes largely to the interest of the discussions and indicates that the questions that were selected are "live" ones and that they cannot be answered fully in a "yes or no" sort of a way.

Once more we would mention that the contest is open to all; it is for everyone, and everyone is urged to contribute his "say so," and to suggest questions which shall bring out interesting and instructive answers.

READ the general conditions again: We will give prizes to those who send in the best answers to the questions printed herein each month, and in order that the contest may be helpful to the greatest possible extent, we will give prizes for the best and most practical questions submitted for the next following competition. There will be three questions in the contest each month, and therefore three prizes for the answers.

THE QUESTIONS FOR THE JUNE CONTEST ARE THESE:

Give instructions and working drawings for the installation of an under-water exhaust in an open boat.
Suggested by C. C. Burnham, Cambridge, Mass.

In buying a used boat, what defects should be looked for and how may they be recognized?
Suggested by G. E. Marshall, Brooklyn, N. Y.

What are the advantages and disadvantages of flared sides for both speed and cruising motor boats?
Suggested by F. P. J. Crowley, New York City.

Answers to these questions, addressed to the Editor of Motor Boating, 1789 Broadway, New York, must be:

(*a*) In our hands on or before March 28th, (*b*) not over 500 words long, (*c*) written on one side of the paper only, (*d*) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.)

Questions for the next contest should reach us on or before the 28th of March.

THE PRIZES ARE:

For each of the best answers to the questions above, any article advertised in Motor Boating, of which the price does not exceed $25, or a credit of $25 on any article advertised in Motor Boating, which sells for more than that amount.

(*There are three prizes, one for each question, and a contestant need send in an answer to but one, if he does not care to answer all.*)

For each of the questions selected for use in the next contest, any article advertised in Motor Boating, of which the price does not exceed $5, or a credit of $5 on any article advertised in Motor Boating, which sells for more than that amount.

For all non-prize-winning answers published we will pay space rates.

To all who send in answers we will give a reproduction of one of our double-page photographs, on heavy coated paper (14 x 20 inches), uncreased and suitable for framing. They are very striking and beautiful.

When you send in your answer state what you will take if you win the prize.

Interior Arrangements for Open Boats.

Answers to the First Question in February Issue.

Engine and Tanks in Water Tight Compartment.

(The Prize Winning Answer.)

EVERYBODY who has ever ridden in a 20 or 30 foot open boat knows the constant attention and care needed to keep the part of the boat clean that is used for the passengers; and for this reason, if for no other, the engine should be separated from this part of the boat by a watertight bulkhead.

If the boat is of a modern type the engine can go well forward and a bulkhead placed aft of the clutch coupling, and with this arrangement you get more room in the cockpit.

Forward of this bulkhead, you will notice, is everything that could possibly make a dirt.

The gasoline tank is located on the bulkhead and a glass water gauge can be let through to the after side of bulkhead to enable the operator to see the amount of gasoline at all times.

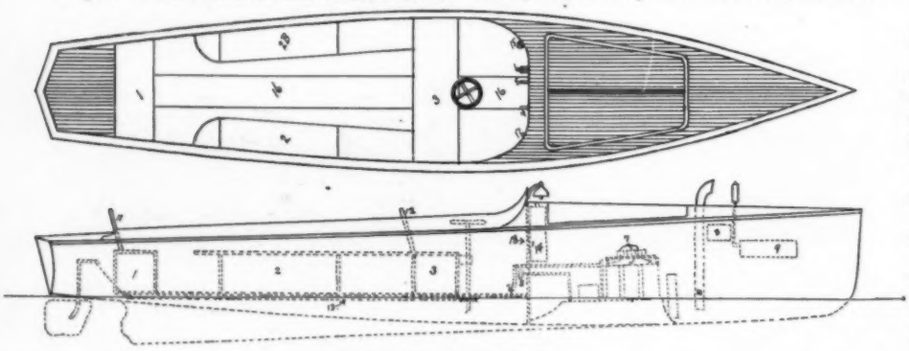
On one side of gasoline tank may be placed a smaller tank, say 6 inches by 6 inches by 21 inches, this will give a capacity of about 3½ gallons of lubricating oil.

The funnel is carried down to the bilges to keep them well aired.

A bilge pump is the only thing aft of bulkhead that might make a dirt but it can not well be placed elsewhere, and if a good pump is used there will not be much danger of dirt here; this pump should have two leads, one to the engine compartment forward of bulkhead, and one to bilge in cockpit, with lever handle, stopcocks in each lead so the operator can pump out either side of bulkhead or both at will; the discharge should lead overboard at least 6 inches above waterline.

The steering gear is another thing I would like to call attention to as it only has two sets of shives to lead through. It is led from a sprocket with chain on end of steering wheel shaft, aft, directly in center of boat under the floor and goes to quadrant as shown, there being a sheave on either side of boat which receives the cable from a set of sheaves under the after locker. There should be room left in front of steering wheel for one to pass.

W. HERBERT SLOAN, Baltimore, Md.



Mr. W. H. Sloan's design.

1. Locker for flags, oilskins, etc. 2. Locker for ice, should be lined with zinc. 2B. Locker for provisions for short trips. 3. Locker for tools and spare parts. 4. Rear starting handle. 5. Clutch control. 6. Spark and throttle. 7. Spark coils. 8. Battery box. 9. Air tank for whistle. 10. Funnel extended to bilge. 11. Lazy-back that can be lifted out so that a spare tiller may be shipped, should steering gear go wrong. 12. Back of operator's seat hinged to lay down forward. 13. Steering gear cable. 14. Gasoline tank. 15. Bilge pump. 16. Floor board that may be lifted out (steering cable under). 17. Whistle pull. 18. Watertight bulkhead.

Position of Motor First Consideration.

THE first and main thing to be considered is the placing of the motor. In boats of this size to really get the best room, the engine should either be forward or aft.

In the average small power boat with a straight run and flat stern, to place the motor aft would give the shaft an excessive rake which, of course, would decrease the efficiency of the propeller thrust.

Only one place remains—namely, forward. This is quite feasible with some of the light motors now on the market.

A general description of the accompanying plans is as follows:

Five feet from the bow is a watertight bulkhead aft of which is the engine compartment. The low raised deck forward affords ample space over the motor. The deck over this space is in the form of a hatch, hinged in the middle.

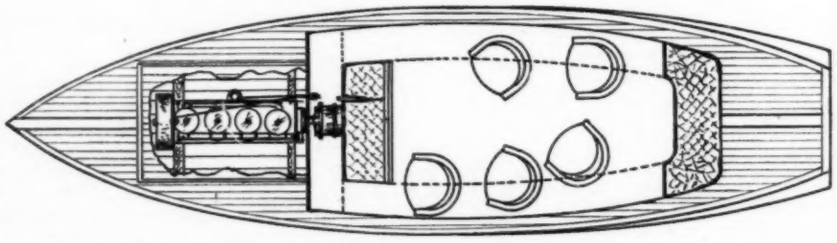
The motor is a 4 x 4, three-cylinder, 18-25 h.p. Pierce-Budd, weighing 217 pounds.

There is also room alongside the engine for magneto-tool locker, etc.

Aft of this is an open space 7 feet 6 inches long and the full width of the boat. At the forward end is the steering wheel with all switches, rear starting device, etc., all within reach of the helmsman. The rest of the space is occupied by wicker chairs. This space being very nearly amdships, there is less motion, so that chairs are better placed here than anywhere else.

Next comes a thwart under which is placed the gasoline tank of 75 gallons capacity and placed high enough so that any leakage will run overboard.

Aft is a cockpit with seats along the sides and at the after end. These form lockers and the after one is particularly suitable for a food locker as it is the coolest part of the boat.



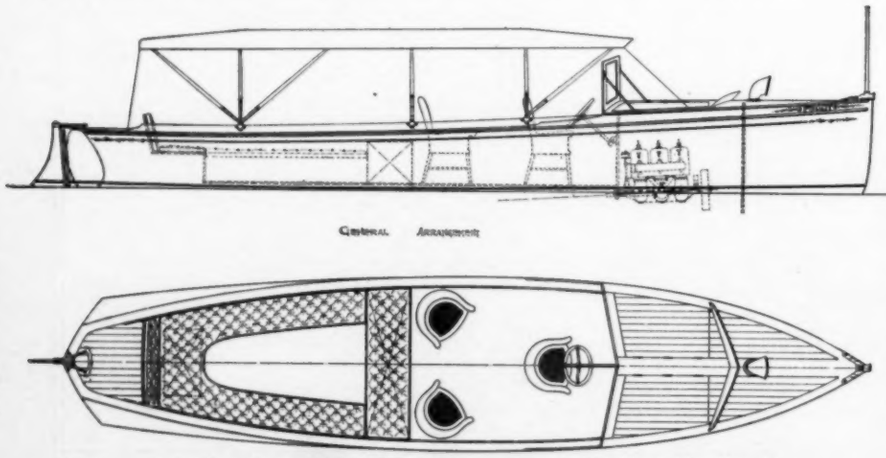
R. W. Goddard's design, with dotted lines showing the position of extra seats.

All the after cockpit seats are covered with cushions.

With the glass wind shield forward and with the automobile top, this should make a very comfortable and attractive little boat.

The dimensions are: Thirty feet over all; 29 feet 6 inches load waterline; 6 feet beam; 2 feet 3 inch draft; approximate speed, 14 miles.

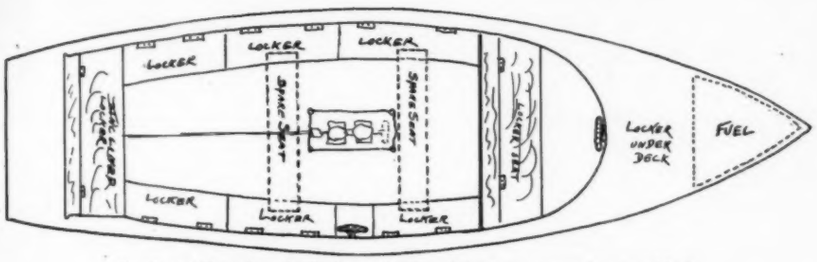
FRED'K W. GOELLER, JR., New York City.



Interior arrangement of thirty footer, by Frederick W. Goeller, Jr.

Extra Seats Provided.

WHAT seems to me to be the best interior arrangement for small open motor boats is clearly shown in the accompanying sketch. The motor according to modern practice is located well forward under folding hatches, while the cockpit is placed aft where little or no spray from the bows can reach it. Gasoline is carried in a large tank at the bow. Opening the hatches over the engine gives plenty of room on both sides of it to work, while on either side of these passageways and under the decking are racks and lockers where tools and spare parts are kept. The sides and stern end of the cockpit are sheathed from the coaming to the floor. in the forward end athwartships is a seat for the helmsman with locker beneath. Under the



In C. C. Burnham's design plenty of locker room is provided.

floor is the reverse gear with its lever running up through the seat. The wheel and control levers to the engine are mounted on the coaming in front. The main floor of the cockpit is ordinarily occupied with comfortable wicker chairs which can be moved about and arranged to suit the tastes of the occupants. Around the stern end of the cockpit is a wide transom which makes a fine lounging place, while beneath it and in the stern under the deck are generous lockers for general stowage.

Of course there are times, such as regatta days, when the owner wants to take out a large party, then a maximum seating capacity is required and comfort comes as a second consideration. This carrying capacity is obtained by means of removable side transoms with fasteners which hook into sockets mounted on the sheathing and forward and after permanent transoms. The inner edge of these seats are strongly tressed so that no other supports than those at the back and ends are required. These side transoms with their cushions when taken out and strapped back to back take up very little room and may be left at the club house, or even carried on the boat, without much inconvenience. If the boat is quite beamy, this is a good plan and the chairs can be lined up in the center aisle, adding more to the seating capacity. But with the ordinary craft, the beam is too narrow for this so that the chairs are best removed when the side seats are to be used and vice versa. This arrangement gives its owner many advantages over his fellow motor boatman, he can adapt his boat to extraordinary conditions without the sacrifice of comfort and elegance ordinarily preferred.

R. W. Goddard, Worcester, Mass.

Plenty of Locker Room.

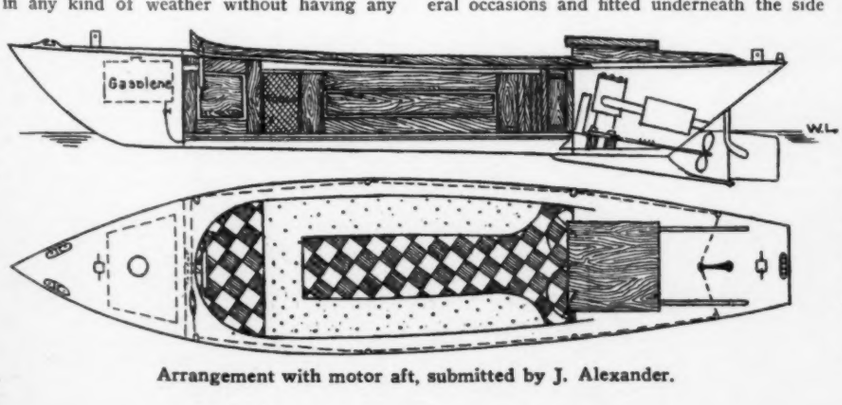
THE engine is amidships, a two-cylinder, two-cycle, 8 horsepower medium duty motor. Surrounding it is a galvanized iron pipe railing which is removable in sections by unscrewing the connections. On the top of this railing, which clears the cylinder relief cocks by about four inches, is mounted a wooden box with a hinged cover top. This box is deep enough to carry the ignition cells and spark coil, and the cover fits down tight and has a piece of 1½ inch half round moulding fastened to its outer edge so as to make it watertight. Of course this box is white-leaded at all joints, and inside it was painted with asphaltum to further insulate it. This arrangement fixed us so that we could go out in any kind of weather without having any ignition or plug trouble, and when we lunched aboard, is served as an excellent table. Because of its location in the center of the boat, it afforded sitting room on all sides.

The seats consisted of a wide cross seat aft which had a hinged top, through which access was had to a zinc-lined locker underneath the after deck and seat in which we could carry ice and supplies for our pleasure trips. Wide seats along the sides led to another, wide seat forward which also had a spacious locker underneath, reached by a similar hinged seat cover. These side seats were also converted into spacious lockers by having hinged covers every few feet. In these we stored all manner of equipment but reserved those sections nearest the engine for tools, oil and repair parts.

Under the extreme forward deck was the fuel tank, well braced and fitted with baffle plates inside so as to stand the heavy wash encountered in a seaway. In this 25 foot boat, this decking covered six feet of the forward deck, and aft of the fuel tank there was a splendid locker for larger equipment, such as anchor, rope, lanters, etc. This was reached by folding doors immediately in front of the steering seat. A steering wheel was located on the coaming here and another at the starboard side near the engine. Ordinarily the boat was handled from this forward seat but when alone the owner would sit amidships where he could operate both the steering and reverse gear quickly.

Under the side seats we carried several ¾ inch boards 10 inches wide and long enough to span the boat amidships and these were used when we wanted to gather round the festive board or when we wanted extra seating room. They proved very handy on several occasions and fitted underneath the side seats when not in use. To complete the outfit, we had made a canvas cover which fitted over the entire engine equipment,—box, railing, engine and all. After waterproofing this we could stand any kind of weather and never experienced engine trouble. When we had ladies aboard this cover was used to protect them from any oil or grease which might come from the engine.

C. C. Burnham, Cambridge, Mass.



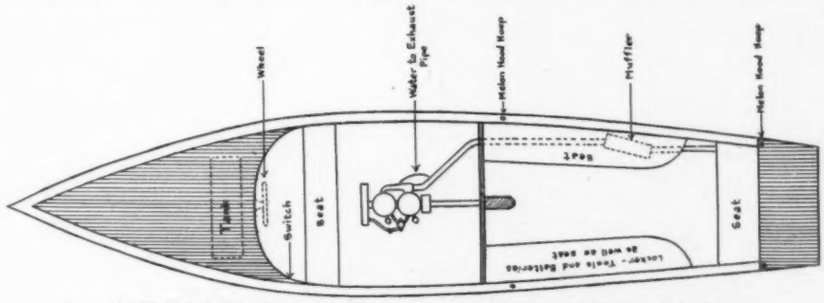
Arrangement with motor aft, submitted by J. Alexander.

Seats Convertible to a Berth.

I HAVE taken for my example the smallest sized boat possible under the question, as by so doing, I feel that my answer will be of service to the greatest number of people.

The plans I enclose have three striking features. First, they allow the boat to be fairly speedy; second, they give a maximum carrying capacity should the occasion require; third, they allow the seating arrangement to be very easily changed into a very comfortable berth.

In a motor boat most people like to ride facing the way the boat goes, therefore, our stern seat allows two passengers to ride that way, as well as the engineer and helmsman forward. If not sufficient the side seats will provide ample accommodations for four more at least.



In E. I. Walkley's arrangement the seats are convertible to a berth.

The wheel is in the conventional place in the bow with a cross seat immediately aft of it and forward of the engine, allowing the operator to have one hand on each. Right at hand also is the switch so that no time is lost in case of a sudden emergency. Aft of the engine, as shown by the heavy line, is a bulkhead dividing the engine from the passenger compartment. This is made fast to the timbers and planking and is of great assistance in strengthening the boat. The passenger compartment, as shown by the drawing, and as already mentioned, contains three seats—one across the stern, which slides forward on its stringers and allows the entire space under the after deck to be used for the stowing of heavy dunnage. The entire cross seat to the port is utilized as a locker for bateries, tools, etc. A switch may be placed on the battery box inside the locker, by the means of which the ground wire may be broken. The advantage of this will appeal to all motorists.

The muffler and exhaust pipe pass under the starboard seat. As the engine water passes out through the exhaust, so no danger need be looked for on that score.

To make this boat good for any purpose the average man would desire, a full length melon hood should be supplied.

Now as to the means by which a twenty foot open boat can be made into a cruiser. As previously stated, the stern seat pulls forward flush with the ends of the side seats, and the back drops into the space thus made at an angle of about 30 degrees, making an ideal foundation for a pillow. The space between the two cross seats is then filled in by two long boards supported at each end by a simple framework made of two uprights and a cross piece. By adding a small mattress and several blankets a very comfortable berth is obtained.

E. I. Walkley, Marblehead, Mass.

To Ride Out a Storm in a Motor Boat.

Answers to the Second Question in the February Issue.

When off Shore or at Anchor.

(*The Prize Winning Answer.*)

IN offering a few suggestions on this question we will confine ourselves entirely to the handling of the boat and assume that the engine is working satisfactorily. We will imagine that there are two of us in a small raised deck cruiser, say one of the Homer 27-footers shown in in the February number. We have our stores and gear, including an extra pair of oars and small anchor for the tender, emergency rig, etc., on board and securely stowed and are ready to meet our storm. This we will do in two positions, first at anchor, and second well off shore.

When at anchor we must watch closely to see that we are not dragging or chafing. If necessary put out an extra anchor or put on a kellet or perhaps do both. A kellet is a weight attached to the cable a few fathoms from the anchor and materially aids in holding. The straighter the pull the harder you hold and the kellet sags the cable and gives a straighter pull on the anchor.

This kellet is any weight that is handy, a piece of ballast, the small anchor for the tender, a bundle of shot-gun shells, in fact anything heavy that you can get a hold of at the moment. It may be attached by hauling in on the cable and making it fast when you are short enough, or it may be slid down the cable on a loop with a small line which may be made fast to the cable when you have the kellet in position or paid out with it when you fall back to ride again.

The engine must be all ready to start as it may be necessary to use it to relieve the strain on the cables.

After doing these things you have done about all you can do when at anchor, except to throw some oil over the bow and hang out an oil bag, which would hardly be necessary, as in all probability, when caught in a storm at anchor we would be in a place at least a little sheltered, and our chief concern should be our ground tackle.

In the second case we will presume that we have left Boston for Provincetown and when about half way between Minots and the Race run into a hard squall of wind from the southwest. We are in too much water to anchor and, as the boat pitches her projeller out frequently when we head up into the wind, we are afraid the racing of the engine will cause something to heat up. After discussing the advisability of running before it under our emergency rig we decide, as that would take us way off shore, we had better rig a sea-anchor and ride it out that way.

The sea-anchor may be made by lashing the extra pair of oars and the boat-hook together in the form of a triangle, using one of our emergency sails for a cover and our tender anchor for a weight to keep it upright when overboard. To each corner fasten a short line, bringing them together so as to make a place to fasten our cable, and after making fast heave it overboard and give a good scope.

If we have no canvas aboard to cover our triangle we may rig our anchor by filling the tender, leading the painter to the stern and fastening it, allowing it to make as large a loop as possible, and making our cable fast to the center of this loop. Fasten the small anchor to the side of the tender that will be nearer the big craft. This will keep her tipped so as to make a better drag. Great care must be used to prevent the tender being smashed under the counter or against the side during this operation.

A common bucket might be used as a sea-anchor, but for our boat it would hardly be drag enough.

As a last resort we will throw out some oil, put our oil bag over the bow, don our life preservers and hope for a let up that will allow us to get under way again.

We have neglected to say anything about closing the hatch, port holes and companion-way, as we think anyone would do these things instinctively. We also think it a good plan to lash the oars into the tender so there will be no danger of their being washed away.

F. M. COMEE, Cambridge, Mass.

Don't Fiddle With the Motor.

ASSUMING that the skipper has been watching the weather, has battened down all hatches, closed the ports and made all movable things secure, the first thing to bear in mind is, "Don't fiddle with the motor." Even if only one cylinder is working, let it alone. The loss of headway in a blow is bad business—the boat wallows in the trough and is either liable to ship more than its share of water or be capsized.

The oil bags should be made ready as well as the drag. It is good practice to have a light running line fixed to the drag, in order that an oil bag may be hauled out clear of the boat. Under certain conditions the further an oil slick is started away from the boat, the better. This running line does away with the necessity of hauling in the drag, should such a conditions exist as mentioned above.

Keep track of the wave formation.

Crested waves should be met not quite head on. The more surface presented the greater the lifting power. If such waves are not met this way the boat will be severely pounded by falling into the trough behind.

Hollow front waves must be met head-on if the danger of rolling over is to be eliminated.

Running before a sea brings up the danger of "broaching to" and rolling over, also the danger of driving the nose under. The best way out of this problem is to resort to the drag, making it a point to see that the line is well payed with canvas or other material to prevent chafing.

Then the seas are abeam tack through them, it lessens pounding with the attendant danger of opening seams.

Last but not least:

Don't be ashamed to pass out life preservers and insist on them being worn.

C. PETERSON, Brooklyn, N. Y.

Not Advisable to Use Engine.

IT must be assumed that the boat is unable to hold her course.

The best means of meeting the emergency will vary so greatly according to type and size of boat, extent and depth of water, material of bottom, proximity and character of coast, duration and violence of storm, etc., etc., that evidently only the general principles applicable to all can be outlined here.

The best available means of keeping the boat's head toward the waves, and of preventing her drifting upon a lee shore, must be adopted. If the situation permits and the engine will run reliably at slow speed, steerage way may be maintained. However, few boats can carry fuel enough to enable them to outlast a long-continued storm, and fewer still can be run slow enough to avoid diving into the big seas. There is danger of damaging the engine or propeller by "racing" when the latter is above water. If anything is ever going to happen to a boat's power plant it will happen during the time of greatest need. In general, therefore, the engine will either have stopped of its own accord or require to be stopped as a matter of prudence, and some plan must then be chosen.

Few motor boats are provided with sails which would be of any use in fair weather, but every one which is large enough to carry one at all ought to have a mast substantial enough to carry a small storm try-sail. This, though small, would need to be very strong in every respect.

Anchoring, although the most uncomfortable mode of riding out a storm, is often the last or only resort. Therefore every motor boat should be provided with one or more anchors of suitable weight, with cables of sufficient length and strength to enable it to anchor in any depth of water. Where circumstances admit of drifting a sea-anchor may be used. One properly rigged should always be carried so that precious time may not be lost in trying to improvise one.

Whether riding to anchor or sea-anchor, plenty of cable should be given because of the flatter angle of pull and the elasticity of a long cable which reduce the violence of the pitching, and correspondingly lessens strains upon boat, cable and anchor. In either case a "spring" should be put on the cable whereby the boat's head may meet the waves a little quartering rather than exactly head-on.

Every effort should be made to prevent seas from boarding the boat. Where rough water may be expected a suitably-rigged oil bag should be carried ready for use. In service it should be kept as far out to windward as is practicable. For use in open waters an open boat should be protected by substantial and well-fastened spray-hoods.

The best instruction is: Before starting prepare to meet the emergencies which may arise.

EDWARD MARSHALL, Piedmont, Cal.

Carry a Sea Anchor.

A SQUALL seldom arrives without giving some notice beforehand and a practised eye will soon note the indications. The action of the wind on the water will be noticed by the way it seems to darken it, and if the wind be severe it will cause a streak of foam on the water and you will hear a deep moaning sound. If coming off the land it can be seen by the dust it is raising and the waving of trees and bushes.

As soon as these indications are noticed it is time to make ready for it and not wait till it hits you. If there is land to leeward of you, head off shore, so you will have plenty of room and also because the waves are always less severe in deep water than in shallow. Be sure everything loose is securely lashed down, especially the anchors, as they are heavy, and if they get adrift they will soon pound a hole in the boat. Slow down the motor and head directly into the waves if they have crests or seem hallow, or they will swamp you.

When the boat begins to feel top-heavy and dips her nose deeply into the sea and takes water over the bows and sides it is time to get out the sea anchor or drag. The accompanying sketch shows the construction of a sea anchor, which is easily made, cheap, durable and reliable. It is a frame composed of two pieces of oak each three inches wide by 1 inch thick and 6 feet long and fastened with two screw bolts and nuts in the center, and by removing the bolts affords easy stowage when not in use. Cover with No. 4 canvas, leaving a pocket at the bottom to hold a flat piece of lead about six or eight pounds weight so the anchor will remain upright. A rope bridle crossed from each corner of the frame with about two feet of slack and a ring seized in the crossing to fasten the line to. When ready to use fasten to a stout line, stop the engine, and as soon as the boat loses her headway drop it over the bow paying out about ten fathoms of line before making fast to the riding bits. This will hold the boat's

head up to the wind and at the same time prevent her from drifting too rapidly. If the waves are breaking badly and the boat is shipping much water get out the oil bags. These can be made in any shape and should be of three or four thickness of heavy canvas to prevent a too free soakage of oil. The usual shape is cylindrical and about six inches in diameter. Stuff with oakum and saturate with oil, cylinder preferred, and allow them to float a few fathoms ahead of the boat. Should they show a tendency to sink, lash a piece of wood to them, as they must float to be of service. Two of these will be sufficient to prevent the sea from breaking, which is the greatest danger to be feared, and leave only a smooth swell from the oil bags to the boat.

This equipment is intended for boats about fifty feet and may be reduced or enlarged as the case may need. The drag is easily stowed away and the oil bags can be kept in an empty can, to prevent soiling the boat, when not in use, and are indispensible for boats cruising in open water.

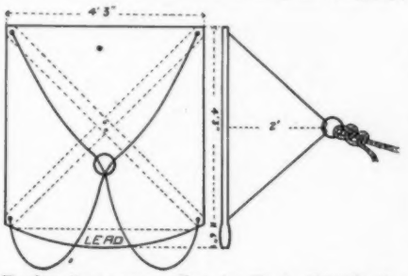
E. A. Crawford, Newark, N. J.

Ride it Out to a Sea Anchor.

FIRST and foremost make every effort to reach port before the storm attains its height.

If you find that there is no hope of reaching shelter and that you must ride it out in the open, make your preparations as early as possible lest the gale should break upon you before all is made snug.

First get ready your "drogue" or sea-anchor if you carry one. Bend on a long, strong rode line and prepare canvas for chafing gear. If you have no regular drogue on board you must construct one from such materials as are at hand. The boat's tender would make a good sea-anchor when filled with water. Or if you do not carry a tender make a strong raft of your cabin floor boards, oars, locker tops and any woodwork available. Lash these together very securely and ballast the raft thus formed heavily with your anchors or pieces of iron or lead ballast. Bend on your longest,



Design for a sea anchor by E. A. Crawford.

strongest piece of line and be sure that it cannot come untied or work off over the ends.

When the boat is riding to the sea-anchor an oil bag will prevent the seas breaking aboard. It should be bent to the cable so as to float upon the water just to windward of the vessel.

The forehatch and skylight should now be covered with heavy canvas nailed down all around.

When the wind becomes violent batten down everything securely, locking the cabin doors and lacing your canvas cover over as much of the cockpit as possible. In case you have no fitted canvas cover do not hesitate to nail a piece of canvas stretched over a strong ridge-pole entirely around the cockpit coaming, covering the cockpit except to leave a large enough opening for the crew in the most sheltered portion.

Run a strong life-line from stem to stern so that a man can get forward to renew the chafing gear on the cable when it requires attention.

Great care should be exercised in launching the improvised drogue to prevent its striking the boat's side and staving in her planking. Pay out the rode line gradually and when well out bend on the oil bag with a length of small line.

In making the cable fast to the bitts be careful lest a sea should board over the bow as her drift is checked by the drogue and sweep you overboard. The cable should be well served with canvas at the bow chock and securely lashed in place.

Should the strain on the rode line be very severe the motor may be run ahead to relieve it. Do not, however, check the boat's drift too much, as a certain amount of leeway is always essential when riding to a sea-anchor.

Allan O. Goold, Portland, Me.

Round Bottom Versus Sharp Bilge.

Answers to the Third Question in the February Issue.

Construction Best for Real Cruiser.

(The Prize Winning Answer.)

BEFORE reaching a decision regarding the advantages of one model over the other it would be well to illustrate the points for and against each, and show the method by which I attempt to prove what I consider the better model.

Calling the "bent frame" No. 1 and the "knuckle V" No. 2 for convenience sake, we find that for seaworthiness No. 2 must excel No. 1. The round bottom of No. 1 is sure to pound in a seaway and throw the spray, making her a wet boat in heavy weather, while No. 2 with her sharp bilge and V-shaped construction will surely ride the waves better and her flaring sides will not only make her more buoyant but are useful in preventing the seas from boarding her.

No. 1 with her light draft offering less resistance to the water than the deep draft of No. 2, will outfoot her in smooth water although she will be at a disadvantage in any kind of heavy weather or choppy sea.

In figuring the boat I find that No. 1, owing to the ease in bending her frames, and that most of these being in one piece, requires considerable less timber for frames and material for fastening and a consequent saving of time and labor.

Appearance is purely a matter of taste, but if considered will favor No. 2 with her graceful lines over the bulky appearance of No. 1.

The construction of No. 1 makes her theoretically stronger, and she undoubtedly is, in still water, but this advantage is overcome in heavy weather, as No. 2's sharp bilges and dead rise offer less resistance, allowing her to rise and fall without pounding, and her more diversified fastenings are better suited to withstand the stress of heavy weather. Hence strength must be conceded to No. 2.

Another point to be considered is the utilization of space. In a small cruiser this is an essential point, and in favor of No. 1. Her round bottom and generous beam afford a better accommodation per cubic feet than No. 2. As space is one of the most important features in a cruiser, for a boat under forty feet No. 1 has a decided advantage over No. 2, but in larger cruisers this is overcome as the beam increases.

Summing up we find that to gain seaworthiness, strength and appearance, we must sacrifice speed and accommodation and add to the cost of construction. While to gain speed (per horsepower), accommodation, and reduce the cost of construction, we must sacrifice seaworthiness, appearance and strength. As boats under forty feet seldom, if ever, undertake cruises through unprotected waters, where there is no "haven" in case of a heavy gale, the shallow draft of N. 1 is a big advantage and makes it the best model for small cruisers in inland waters, but for boats of greater size and in fact for any craft that is to be used for real cruising, the V-shaped construction makes the best all-round boat.

Harry J. Hunter, Newark, N. J.

Round Bottom Has Every Advantage.

THE round-bottom is a more seaworthy form than the "dead-rise," because for boats of equal dimensions of above-water body it will have a larger under-water body. Flare, which is of utmost importance to a boat's buoyancy can be used more effectively. It is a matter of common knowledge that a whaleboat is a better sea-boat than is even the famous dory.

The round-bottom will be the faster because it will have a smaller surface exposed to skin friction and less depth reaching down into solid water. It can be given a finer entrance, making less of a bow-wave; and a cleaner run, thus dragging a smaller stern-wave.

Admirers of the "dead-rise" type claim cheapness as one of its strong points, but it is impossible to see how there can be any material difference where the two boats are of equal quality and workmanship. "Bending oak" may cost a little more than stuff for straight frames, but it is also better. The "dead-rise" boat is no easier to plank unless the planks run crosswise, but who wants a real boat planked that way? If it has any advantages on account of simplicity the same arguments apply with still greater force to the scow, so why not choose the latter?

Beauty may be "only skin deep," but still it is a factor of considerable inportance in any boat, especially in one used principally or wholly for pleasure. The warmest advocates of the "dead-rise" boat have never yet offered one as a candidate in a beauty show.

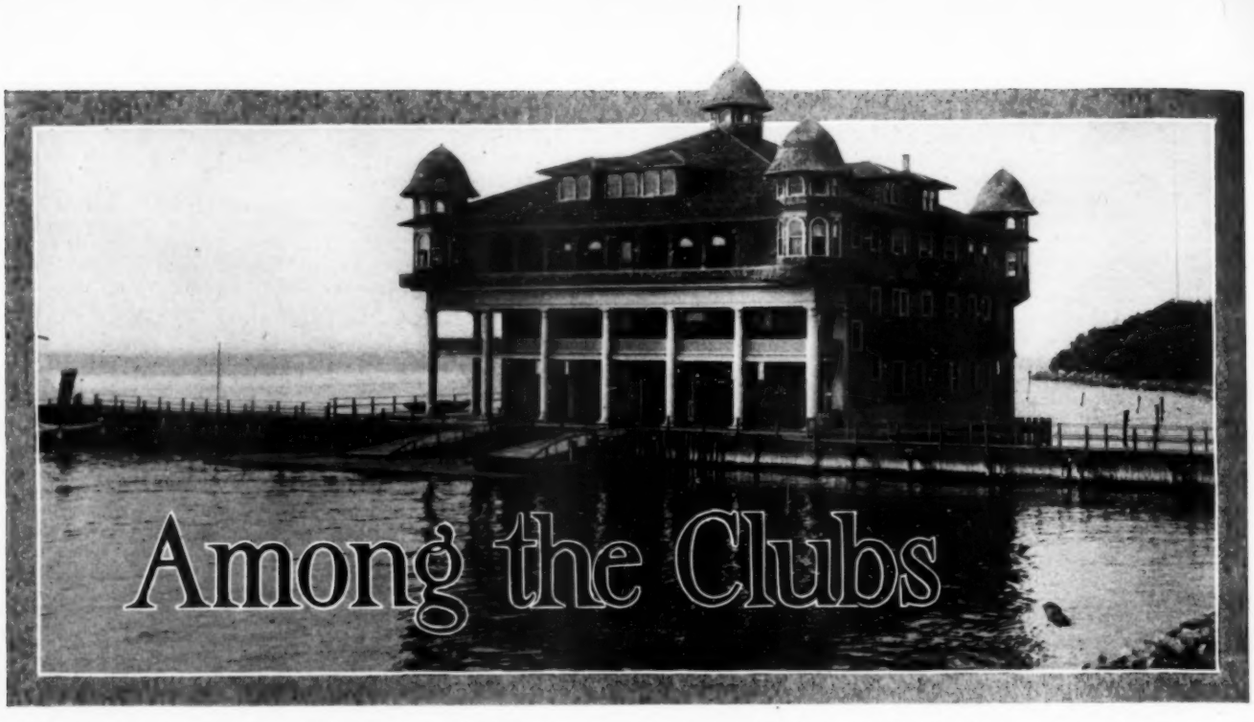
The round-bottom boat is far stronger than the "dead-rise." Those who favor the latter type speak of the well-known rigidity of the triangle as an architectual form, but the comparison is unfair. There is no triangle about it unless one is made by joining the knuckles across the boat. Few boats can afford to sacrifice interior space, comfort and convenience for this purpose, but if desired the round-bottom boat can do so as readily as the other with equally good results. The section of a "dead-rise" boat is more correctly described as a pentagon, which is weaker than a semi-circle. Compare with the common wagon-bow, which is a light, bent frame extending in one piece from side to side of the wagon-box and describing a semi-circle overhead. Nobody has ever been rash enough to suggest that it would be stronger if made of four short, straight pieces forming these joints.

Edward Marshall, Piedmont, Cal.

Dead-rise More Seaworthy.

FOR a cruiser the best shape is V-shaped bottom with flaring sides, when head-on such a boat can throw off all waves that strike her with less pounding than any other design. Also the more she leans over on one side the more bearing she has on the water. If she is designed so that the bilges come above the water she can make record speed. The planking used is less than on any other design. The planks and frames have less bend, which saves time and cost in building. Any bow or stern can be used in her design, and she can be built as strong and looks as well as the skill of her designer can make her.

J. Alexander, Philadelphia, Pa.



Among the Clubs

Hudson River Motor Boat Club, New York City. The following officers have been elected for the year 1910: Commodore, W. E. Sopper; vice-commodore, Wm. Foran; rear-commodore, E. J. Woodward; secretary J. A. Dunham; treasurer, George Muntz.

Murphysboro Power Boat Association, Murphysboro, Ill. This new club, which was organized the latter part of February, has elected the following officers for 1910: Commodore, J. C. Sill; vice-commodore, W. T. Simpson; rear-commodore, A. C. McDonald; secretary, F. D. Shelley; treasurer, Dr. C. E. Riseling; treasurer, Irwin Stecher. It is planned to build a dock and club house in the near future.

Thousand Islands Yacht Club, Alexandria Bay, N. Y. At a recent meeting of the Regatta and One-Design committees of the club, it was decided to hold the races for the Gold Challenge Cup either the first week in August or the last in July, so that contestants who show sufficient speed to warrant belief in their success may be sent to Huntington Harbor to participate in the elimination trials for the International Races for the Harmsworth Cup. The annual mid-winter dinner of the club was recently held at the Waldorf-Astoria, in New York, and a number of new trophies for the coming season were announced. A special trophy has been offered by Commodore C. M. Inglis for the race among power boats of one design; Mrs. Frederick K. Burnham has offered four trophies, one of which is for the championship of the St. Lawrence River for 12-meter boats; Vice-Commodore Geo. C. Boldt has offered two silver cups for first and second prizes to be known as the Selected Score Cup, to be competed for between May 15th and September 15th; and T. A. Gillespie has offered a trophy for a 100-mile race among the twenty one-design boats which the club is having built. The club has decided to purchase a 26-foot house boat, which will be anchored off the club house and will be very completely fitted for the use of the regatta committee.

McKeesport Launch Club, McKeesport, Pa. This club will hold their annual regatta during the Old Home Week in McKeesport, from July 4th to 9th, and an effort will be made to hold a boat, engine and accessory show, provided a suitable building can be procured. The following officers have been elected for the coming year: Commodore, R. L. Thayer; vice-commodore, L. B. Davis; rear-commodore, C. Clintner; purser, F. A. Decker; corresponding secretary, W. R. Lansford; fleet captain, C. Markus.

Cedar Rapids Motor Boat Club, Cedar Rapids, Iowa. At a recent meeting of this club the following officers were elected: Commodore, C. H. Maxson; vice-commodore, D. H. Livingston; rear-commodore, F. F. Hallett; secretary, Dr. H. J. Calder; treasurer, A. H. Roth; fleet captain, C. A. Dieman. A committee was appointed to investigate the matter of erecting a club house, and there is every indication that in the near future the club will have a home of its own.

The Waterway League of Greater New York and Long Island. This organization will hold meetings for the balance of the season, upon April 12th, May 10th and June 14th, at 8 Nevins Street, Brooklyn. The league was organized to secure inland waterways connecting bays and rivers with New York Harbor and Long Island Sound; to secure lighted buoys for all navigable waterways; closer relationship of boat, yacht and sporting clubs; purification of waterways; widening, deepening and clearing channels; and supporting and encouraging water sports, racing, etc.

Petoskey Motor Boat Club, Petoskey, Michigan. This club, which was formerly known as the Little Traverse Boat Club, recently elected the following officers: Commodore, A. G. Cook; vice-commodore, J. S. Burnham; rear-commodore, W. A. Pock; secretary, H. L. North; treasurer, Leon Chichester; fleet captain, E. F. Boss; measurer, R. T. Merrill.

Westville Power Boat Association, Westville, N. J. Officers have been elected for the ensuing year as follows: Commodore, Charles Hassenforder; vice-commodore, A. Egolf; rear-commodore, D. Humphreys; secretary, James T. O'Brien; treasurer, G. C. Ade. The club is at present in a very prosperous condition and several new boats have been added to the fleet for the coming season, which opens on May 31st.

Stamford Yacht Club, Stamford, Conn. The following officers have been elected for 1910: Commodore, R. H. Gillespie; vice-commodore, G. C. Blickensderfer; rear-commodore, J. S. Jenkins; secretary and treasurer, Herbert Lawton: fleet surgeon, Dr. J. H. Stubb; measurer, Harry S. Hart; chaplain, Rev. Charles J. Ryder.

Eastern Yacht Club, Boston, Mass. This club, which has been foremost in International Sunderklasse Racing for the past four years, and which will entertain the Spanish yachtsmen next summer, recently held its annual meeting and elected the following officers: Commodore, F. L. Clark; vice-commodore, R. T. Paine, 2d; rear-commodore, H. N. Sears; secretary, Henry Taggard; treasurer, P. T. Jackson.

Bellport Bay Yacht Club, Patchogue, L. I. At the recent mid-winter dinner and meeting of this club a number of important matters were brought up for consideration, among which were a number of letters from the Lake Michigan Yachting Association, in reference to the one-design class, and from Sir Thomas Lipton, referring to South Bay yachting matters. The committee which opened the Old Inlet last season as a club station was reappointed and authorized to renew the lease for two years. Three new boats of the one-design class have already been ordered, and special prizes have been offered for races among these boats next season.

Richmond Yacht Club, Richmond, Va. A charter was recently issued by the State Corporation Commission, allowing this organization to conduct a yacht club and to engage in fishing, bathing and boating on the waters of the James River. It is the intention of the corporators to begin early this spring upon the plans for a club house, which will be built close to the street car lines, some distance down the river.

Corinthian Yacht Club, Boston, Mass. For a number of years this club has held annually an ocean race to White Island and return for boats of 21 feet water line and over, but recently the number of entries has been falling off, due probably to the fact that the same course, year after year, becomes monotonous. The club has now under consideration a new plan whereby the contest for 1910 will be over a different course, probably from Marblehead around Portland Lightship, which is situated off Cape Elizabeth. A race over this course will give a total sailing distance of 144 miles, 72 miles in each direction.

Bayonne City Yacht Club, Bayonne, N. J. Articles of incorporation of this club were recently filed, and it is planned to hold a number of races during the coming season. The incorporators are C. B. Easton, T. B. Mettam, Frank Arelogan, J. P. Bernhardt and M. F. Pipper.

Seattle Yacht Club, Seattle, Washington. A large number of races has been prepared for this season, which opened the latter part of February. The races for power boats will include a cup race from the club house to the Vashon Islands and return; a cup race to Everett and return; a cup race to Olympia; a cup race to Port Townsend; and a cup race to Victoria upon July 1st for boats not entering in the long-distance race.

Yacht Racing Association of Gravesend Bay, Brooklyn. The recent annual meeting of this association was attended by delegates from the six clubs composing it, the Atlantic, Bensonhurst, and Brooklyn Yacht Clubs, New York Canoe Club, Marine and Field Club, and the Crescent Athletic Club. G. R. Le Sauvage, of the Bensonhurst Yacht Club, was elected president, and Louis Tieman, of the New York Canoe Club, was elected secretary and treasurer. H. J. Gielow, of the Atlantic Yacht Club, was elected measurer. It is the intention of the association to promote motor boat racing on Gravesend Bay this summer, and if a practical plan can be formulated for governing such contests, some interesting races are assured. The Atlantic Yacht Club will open and close the yachting season on the bay, and it is likely that racing will start on May 28th and close either on September 17th or September 24th.

Inter-Lake Yachting Association, Toledo, O. At a meeting of this association held recently in Detroit, it was decided to hold the annual regatta at Put-in Bay on Lake Erie, during the week of July 18th. An important change in the by-laws was adopted providing for two regatta committees, one for power-boat races and one for sail boats. Under existing rules, the secretary and treasurer is in general charge of the program and the commodore is ex-officio head of all committees, hence there will be no opportunity for clashing in the management of the two classes of sports.

The Objects and Aims of the A. P. B. A.

What This National Body Seeks to Do and How It Proposes to Do It. The Readjustment of Racing Classifications---Club Membership.

By H. T. Koerner, President.

THE American Power Boat Association, one of the oldest organizations of its kind in the country, has for its object the promotion of racing among power boats, and under the articles of association, the membership is made up of clubs, the club being the unit of membership. Representation in the Association depends upon the membership of the club, there being one representative for every one hundred club members. Before power boating reached its present proportions, the clubs composing the Association were largely yacht clubs, but of later years the clubs devoted entirely to motor boats have so largely increased, that they now outnumber the others. At present there are enrolled in this association over 100 clubs, scattered over the United States and representing the ideas of many different sections.

When power boat racing first came into vogue the Association promulgated a rating formula which was designed to bring boats of a widely varying type to a common basis, which, in those days of few boats, was much more necessary than at the present time. This rating formula has been changed from season to season as necessity showed itself, and all the principal power boat events for the last five or six years, including the Marblehead Race, the New York-Bermuda Race, the New York-Block Island Race, the Lake Ontario Long Distance Race, the New York-Albany Race, the Gold Challenge Cup Races and many others have made use of these rating rules. The Association, a number of years ago, gave a gold challenge cup for high speed motor boats, which has been competed for annually ever since, and has since 1905 been held by different clubs upon the St. Lawrence River. Cups have also been presented to the St. Louis Power Boat Association, and it is proposed this season to give a silver challenge cup for high speed boats not over 32 feet in length.

As the speed of motor boats has so greatly increased, during the past few years, as a result many of the races, particularly the Gold Challenge Cup Races, have not been close enough to furnish excitement to either the contestants or the spectators. For this reason the Association is taking steps to re-adjust the rating formula to meet the demand of modern boats and all the clubs forming the Association have been asked to give their actual experience with the formula, as it is now in force; and leading naval architects have also been asked to suggest changes for the betterment of the rules. The Association also has in view the formation of restricted classes, boats of given length, in which the maximum power will be fixed and the minimum weight as well, so as to secure boats strong enough to last through several seasons of hard use and so designed that they cannot be made a back number by boats of unusually high power and freak construction. It is planned to make these restrictions rigid enough so that a boat's racing career will not be limited to one season, and it is hoped through the co-operation of the clubs, to bring about racing between these boats from widely varying sections of the country.

There is also under way a project for standardizing the motor installation, so as to secure for members of the Association better insurance rates, and when this project is taken up with the underwriters, it is hoped that it will lead to a standard form of installation, which will permit of a minimum rate and more liberal terms on the part of the underwriters.

Last year the Association adopted new rules which permit the formation of local sections of the Association, comprised of five or more clubs, the chairman of the local section becoming a vice-president of the Association and a member of its council. In all local matters this branch association has the entire jurisdiction and its representation on the board of the parent association gives it a voice in national matters. A large number of clubs have applied for membership in this manner and a number of sections are now in process of formation, so that it is expected that, during the coming season, the membership of the Association will be more than doubled, and a great increase in power boat racing interests will be the result.

A great deal of dissatisfaction has been expressed in regard to the gold challenge cup races held on the St. Lawrence, and since a challenge has already been accepted for these races during the latter part of August or the first part of September, of this year, the president of the Association has been authorized to look into the matter of changing the conditions governing these races. It is the intention to hold a special meeting in the near future, at which time delegates from every club represented are expected to be present, and voice their opinions in regard to proposed changes in these rules.

An expression of opinion has also been invited from the clubs comprising the Association as to the advisability of promoting one-design class races or promoting races between boats built under restrictions as to length over all, minimum weight and maximum cylinder volume. The classes which have been suggested are of 20, 26 and 32 feet length over all design, to give a reasonably high speed, in a boat of solid construction and moderate cost, the idea being to eliminate the present condition of over powering and consequent great expense. These classes would be known as restricted racers.

The present officers of the American Power Boat Association who were recently elected are: President, Herman T. Koerner, of the Motor Boat Club of Buffalo, N. Y.; secretary, Morris M. Whitaker, of the Crescent Yacht Club of Watertown, N. Y.; treasurer, J. Norris Oliphant, of the Thousand Islands Yacht Club of Alexandria Bay, New York; and measurer, Henry J. Gielow, of the Atlantic Yacht Club of New York City.

The Association has decided to support Senator Brackett's bill, which provides that all motor boats must be equipped with a suitable muffler to stop noise from the exhaust. This bill was introduced in the New York Senate.

Motor Boat Shows for 1910.

March 19 to April 3: Berlin.—Automobile and Motor Boat Exhibition.

March 21 to 30: Buffalo.—Third Annual Power Boat and Sportsmen's Show held in Convention Hall under management of Buffalo Launch Club. Communications should be addressed to Dai H. Lewis, 760 Main St., Buffalo.

March 26 to April 2: Chicago.—Chicago Show of Western Manufacturers (sanctioned by the National Association of Engine and Boat Manufacturers) held at First Regiment Armory, 16th St. and Michigan Ave., under management of Chester I. Campbell.

March 26 to April 2: Montreal.—Montreal Motor and Sportsmen's Show held in the Coliseum. All communications should be addressed to E. M. Wilcox, Mgr., 123 Bay St., Toronto, Ont.

April 11 to 16: Washington, D. C.—Show held by the Sportsmen's Association in 15th Street Armory. B. C. Washington, Manager.

April 23 to 29: Bangor, Me.—Eastern Maine automobile and motor boat show, held in the Auditorium.

June 13 to 16: Cincinnati.—National Gas and Gasoline Engine Trades Association exhibition held at the Sinton Hotel.

Racing Events for Year 1910.

April 1 to 14: Monaco, France.—Seventh International Motor Boat Meet. Prizes will aggregate $24,000 in value.

May 21: Philadelphia, Pa.—Start of the Philadelphia-Havana race, covering a distance of approximately 1,300 miles and open to seaworthy boats of from 50 to 100 feet over all.

May 30: Brooklyn, N. Y.—Annual regatta of Brooklyn Yacht Club.

June 25: New York.—Start from the lower bay of the New York-Bermuda race under the auspices of the Motor Boat Club of America.

July 2: Brooklyn.—Start of annual regatta held by the Brooklyn Yacht Club over the Cape May course.

July 4 to 6: Peoria, Ill.—Annual regatta of the Mississippi Valley Power Boat Association. Prizes aggregating more than $4,000 will be offered

July 4: San Pedro, Cal.—Trans-Pacific Power Boat race to Honolulu, Hawaii, 2,086 miles Open to regular club boats under 80 feet L. W. L.

July 18 to 24: Put-in Bay, O.—Annual regatta of Inter-Lake Yachting Association of Lake Erie.

July 23 to 30: Brooklyn, N. Y.—Annual cruise of Brooklyn Yacht Club.

August 20: New York.—British International Races for the Harmsworth Trophy, over the Huntington Bay course, Long Island Sound.

August: Juneau, Alaska.—This race will probably start during the third week in August and will run over a course from Juneau, Alaska, to Seattle, a distance of over 1,000 miles.

August 27 and 28: Peoria, Ill.—Second annual regatta of the Western Power Boat Association.

September 5: Chicago.—Annual regatta of Calumet Power Boat Club under auspices of Western Power Boat Association.

What Must a Small Boat Carry

Hydroplanes and the British International Trophy, Something About Waterways, A Home Made Muffler and Letters from MoToR BoatinG Readers.

The Required Equipment.

To the Editor of MOTOR BOATING, *Sir*: Although I am a resident of Canada and run my boat principally in Canadian waters, there are a number of us in this section who have occasion to go to the American side, and many are under th· impression that the American pilot rules are more strict than the Canadian. For the benefit of those of us who are in doubt, may I ask a few questions, which I trust you will answer in your columns? My boat is 27 feet long and has a canopy top. (1) Must I carry a foghorn and fogbell? (2) Must I carry a stern light in addition to how and side lights? (3) Must I have the name painted on the boat? (4) Must I carry life preservers? The boat is not used for carrying passengers. C. H. S.

Kingston, Ona.

We print herewith a short abstract of the laws at present in force in American waters as applying to small boats, which we think will answer all of your questions. A more complete statement may be obtained in pamphlet form from the collector of any American port.

Whistle, Foghorn and Bell. All motor vessels, without regard to size or use, must be provided with an efficient whistle, an efficient foghorn and an efficient bell. No size or style is prescribed, provided all are available for the use for which they are intended. The power must be sufficient to produce a prolonged blast of from four to six seconds duration.

Lights. All boats must carry between sunset and sunrise a bright white light at the bow, a green light at the starboard side, a red light at the port side and a white light aft, showing all around the horizon to range with the head light. The law does not appear to permit the use of three color combination lights.

Copies of Rules. All vessels are required to have on board at all times two printed copies of the rules, which may be obtained from local inspectors.

Life Preservers. Vessels not carrying passengers for hire of under 15 gross tons are not required by lay to carry life preservers, although the Depatment recommends that a life preserver for each person on board be carried on all motor boats, regardless of size or occupation.

Documenting, Inspection, etc. All motor boats of over five net tons engaged in the carriage of freight or passengers for hire must be documented or licensed by the collector of customs. Vessels under five net tons are not documented in any case. The license of the vessel obtained from the collector of customs is additional to and must not be confounded with the license required for the operator of a motor boat of 15 gross tons or less carrying passengers for hire. Motor vessels of over 15 gross tons engaged in the carriage of passengers or freight for hire must also be inspected by the United States local inspectors of steam vessels and must carry a licensed engineer and a licensed pilot. Documented vessels must have name and home port on stern and name on each bow. Officia lmeasurement is necessary only in case of vessels requiring to be documented. While the law does not require it, the Department recommends that the name be conspicuously displayed on undocumented motor boats.

The columns of MOTOR BOATING *are open to its readers, not only for asking questions, but for placing before the other readers ideas, results of experience, opinions, etc., that should be interesting or helpful to them, but the editor will not, of course, be responsible for any opinions expressed or statements made in such communcations. The name and address of the writer must necessarily be given in every case to make an answer by mail possible (no anonymous contributions will be considered for publication), bu names will be omitted in publishing the letters and answers where desired, in which case it is desirable that initials or other distinguishing signature be appended. Through the correspondence department subscribers to* MOTOR BOATING *may be of direct aid to one another in solving the problems to motor boatmen.*

Regarding Waterways.

To the Editor of MOTOR BOATING, *Sir*: As I was planning a motor-boat cruise through the territory in question, will you kindly tell me whether there is an inland water route between Providence, R. I., and the Connecticut River? C. C. B.

New York City.

A yet there is no inland water route between Providence and the Connecticut River. However, surveyors are now at work laying out the line for a canal from Little Narragansett Bay near Watch Hill to Wickford, R. I., which when completed will furnish an inland route between the places mentioned, avoiding the necessity of rounding Point Judith. Even when the proposed canal is finished it will be necessary to make part of the trip through Fisher's and Long Island Sounds, as no provision has been made for a route direct from Little Narragansett Bay to the Connecticut River.

Hydroplanes and the British International.

To the Editor of MOTOR BOATING, *Sir*: In reading the accounts of the British International Races for the Harmsworth Trophy and the prospects of the coming race, I have never seen any reference to hydroplanes. Is this because they are not eligible? As this question I am sure would be of interest to other of your readers will you kindly answer it in your correspondence department? Can you tell me also whether or not hydroplanes are eligible for the races of the American Power Boat Association? W. H. B

Princeton, N. J.

We find no clause in the conditions governing the Britsh International Cup Race or those for the races of the American Power Boat Association excluding hydroplanes. In fact it has been rumored that one of the British challengers for the Harmsworth Trophy, which are to be sent over this season, will be a boat built on the hydroplane principle.

A Home Made Muffler.

To the Editor of MOTOR BOATING, *Sir*: My boat is a small one and to give up very much space to a muffler was a serious question.

Perhaps the following description of how I quickly, cheaply and effectively solved the problem may interest some other boat owner.

I had started the season without ont, running my exhaust pipe straight out the side of my boat and piping the jacket water into it, to keep it cool and partly silence the noise of the explosions. This did not work as well as I hoped and besides when the wind blew from that side of the boat it blew a thin sheet of spray from the exhaust over the boat and its occupants.

Cutting a thread on the outboard end of the exhaust pipe I screwed on an elbow, then a close nipple and a cap. In the end of the cap and on the outer and under sides of the elbow and nipple I had drilled about fifty quarter inch holes, or enough to equal one and a half times the inside area of my exhaust

(*Continued on page* 50.)

How Much Does a Motor Boat Cost?

WE called attention to this series in our last issue. In the May issue, which is the next one after this, we shall include the first of the series and will take up the $100 motor boat. But if your boat cost more, don't let that fact keep you from sending in her photograph and a description of her at once. If she did cost you $100 or less, tell us about it right away or it will be too late. Here is the announcement again. Rear it and then act.

BEGINNING in the May issue of MOTOR BOATING we shall run a series of twelve articles—or they might more properly be called departments—one in each issue, which will contain descriptions and illustrations of boats that can be had for $100, $200, $300, $500, $1,000, $2,000, $5,000, $10,000, $15,000, $25,000, $50,000 and $100,000—of boats that are offered on the market at those figures, or boats that have been built at them. The $100 boats will be in the May issue, the $200 boats in the June issue and so on throughout the entire range of costs.

IN carrying out this plan we want to ask for your help. You have a boat. Was she built especially for you? How much did she cost? Do you like her? What features has she that you think are especially good? Send us a good photogroph of her—two or more if they are necessary to show up the good points. Send us a brief description of her. Tell us why you think she is good, how she could be made better without adding to her cost. If you can, send her lines. Tell us what she can do, what sort of an engine she has. Send this matter—the photographs, or lines ,and the description—to us now, so that we may have it all ready to use in the issue which has the boats of approximately the same price. We shall group the boats which cost $100 or less, over $100 but not over $200, over $200 but not over $300 and so on. Send it to the Editor of MOTOR BOATING, 1789 Broadway (yes, we have moved), New York City, and mark it "Motor Boat Cost Series." You probably will be able to give someone else a good idea in return for the many you undoubtedly will get from the series—and we will pay for the matter that we use.

New Things for Motor Boatmen.

New Attachments and Accessories That are Offered to the Man With a Boat. The Month's Production of Devices Designed as Aids to Motor Boating.

[Under this heading will appear each month descriptions and, whenever possible, illustrations of the various devices designed to add to the pleasure and comfort of motor boating which have been brought out since the previous issue. It should be kept in mind that the department in any one issue is, as it were, only one month's instalment of the many useful things on the market, and that it will be well to consult the previous issues of MOTOR BOATING which will form, together, a very complete illustrated directory of the things the motor boatman needs.—In writing the makers of the articles shown, if our readers will mention MOTOR BOATING, they will receive special attention.]

Fig. 1—Morsco Searchlight.

Morsco Searchlight (Fig. 1).—C. D. Durkee & Company, 2 South Street, New York. These searchlights, which may be attached either to the deck by means of an adjustable bracket or to the coaming, will throw a penetrating light a distance of 250 feet, and will give thirty service hours on four dry cells, making the operating cost about 1½ cents per service hour. They are of a special design, having a hand-burnished silvered reflector of great power, and are equipped with Tungsten bulbs. The lamp itself is made of brass throughout, and the arc of light thrown may be made larger or smaller by simply turning a thumb screw. The price of the complete outfit, including either a deck or coaming bracket, 10 feet of waterproof cord, a waterproof plug, a four-candle-power, six-volt Tungsten bulb and a swivel bracket and screws, is $10. Extra Tungsten bulbs are supplied at 60c. each.

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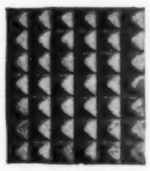

Fig. 2—Aluminum Matting.

Metallic Matting (Fig. 2).—Metallic Automobile Matting Company, Rochester, N. Y. This floor covering is made of pressed aluminum and is designed especially for the floor and running boards of automobiles and for the floors of motor boats. It has a white satin finish, is non-corrosive, will not spot from oil or grease and can be easily cleaned at any time. The pyramidal surface of the aluminum allows a good foothold and forms an excellent covering for floors for this reason, It is made in various widths, cut either to desired length, or it may be supplied in continuous lengths at prices ranging from 50 cents to $1 per lineal foot. Since the material can be cut off as desired there is very little waste, and it makes practically an ideal floor covering.

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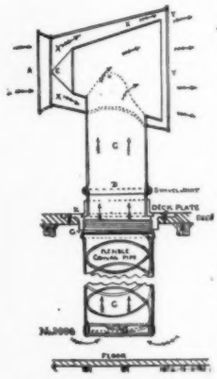

Fig. 3—Autoforce Ventilating System.

Autoforce Ventilating System (Fig. 3).—Autoforce Ventilating System Company, 53 Devonshire Street, Boston, Massachusetts. The system which we show herewith is claimed to provide perfect ventilation for boats under every condition of wind and weather. The Autoforce marine air pump with which this equipment is provided is said to produce a natural and positive drive which will pick up air from the bottom of the boat, lift it and discharge it upward. A ventilator is attached to the deck plate with suitable connections underneath for attaching a collapsable canvas pipe. The device is so arranged that the air entering this pipe increases its speed until it is practically a forced draught and works upon the same principle as the injector. The canvas pipe is made with expansive rings and extends to within a few inches of the floor while in use, but since the lower end is free it offers practically no obstruction. It is but a moment's work to detach it from the deck plate.

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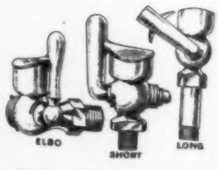

Fig. 4—Durtout Priming Cup.

Durtout Priming Cups (Fig. 4).—Chas. E. Duryea, Reading, Pennsylvania. The feature of these priming cups is the fact that they are covered by a slide which may be easily removed when it is necessary to use them. Dust and grit are quite likely to enter the cylinders when ordinary priming cups are used, being washed in with the gasoline. The use of the priming cups with covers prevents any dirt from accumulating from the outside, and the cylinders will be found to be less carbonized as a result.

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Fig. 5—Combination Launch Lantern.

Combination Launch Lantern (Fig. 5).—The Rose Manufacturing Company, 910 Arch Street, Philadelphia, Pennsylvania. These launch lanterns are made of highly polished brass 9½ inches in height. The front light contains a 2½-inch photo ground lens, and the port and starboard lights measure 3x3¼ inches. These lamps are fitted with a patent repeating system and will burn kerosene for thirty-five hours with one filling. They are made in accordance with United States marine regulations and will stay lit under all conditions.

Weelite Binnacle Lamp (Fig. 6).—A. S. Morss Company, 210-12 Commercial Street, Boston, Massachusetts. This lamp does away with the nuisances of oil binnacle lamps and gives a steady light of just enough and not too much power. The lamp will operate on one dry battery, and when the increased service is considered the cost is not greater than with an ordinary oil lamp. The lamp will not short circuit, and by the use of Hermetic battery cases a moisture-proof service may be had which is secure against all kinds of weather. This lamp may be installed in any binnacle and need not be removed unless desired, although it can be taken out quickly and easily without tools.

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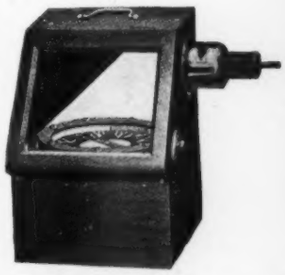

Fig. 6—The Weelite Binnacle Lamp.

Self-Lighting Cigarettes (Fig. 7).—Autolite Manufacturing Company, Newark, New Jersey. These cigarettes will be found especially useful for motor boatmen, inasmuch as they will strike and light on the box in any kind of weather. They are made of selected Turkish tobacco and are equipped with a self-lighting disc upon one end, which is guaranteed to be absoltuely harmless and tasteless. Small perforations just below this lighting disc or cap act as a vent, so that when the cigarette is ignited the resulting fumes of carbon dioxide pass out through these vents. These cigarettes are made in two grades—the Autolite, selling for 25c. a box, and the Monolite, for 15c.

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Fig. 7—Self-Lighting Cigarettes.

Life-Saving Attachment for Oiled Clothing (Fig. 8).—C. D. Durkee & Company, 2 South Street, New York. The Hodgkins patented life-saving attachment as applied to Sawyer's excelsior brand of oiled clothing is shown herewith. This simple attachment is composed of an air chamber which is easily inflated through a tube located inside and near the front of the garment. The garment can be inflated and worn without any inconvenience, although this is not a necessity, inasmuch as anyone who can swim at all would be able to fill the air chamber sufficiently, even while in the water, to support him. The tube is equipped with a check valve, and the air chamber can be inflated with little more than a single breath. The price of coats equipped with this device is 50c. more than the price of the regular garment.

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Fig. 8—Hodgkins Life-Saving Clothing.

Zimmerman Quadrants and Handles (Fig. 9).—The Zimmerman-Smith Company, North Tonawanda, New York. By the use of these quadrants it is a simple matter to attach one of the timers made by this company to any marine or stationary engine. The quadrant itself contains the uppermost journal of the timer shaft and can be attached either by bolting it to a cylinder or to a bracket, as the case requires. While these quadrants are bored for half-inch shafts they may be easily rebored for shafts up to three-quarter inch. They are of brass castings, highly finished and will remain where set. The price of these quadrants and handles is $2.50.

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Fig. 9—Zimmerman Timer Quadrants.

The Boyle Muffler (Fig 10).—John Boyle Machine Company, Peabody, Massachusetts. This muffler is water cooled and is constructed in such a way that the water space around the inner shell, containing the coils, extends around each end and can be placed in any position desired without danger of setting fire to the woodwork. The gases upon entering this muffler go to the center of the first coil until they strike the deflecting plate separating the two coils, and then pass through this in a thin sheet until they strike the cooling surface of the housing. They then go across and enter the outside of the second coil, pass in a thin sheet to the center through the exhaust pipe and spraying nozzle and then to the open air. These mufflers are made in four sizes, of 6 inches diameter from 10 inches to 15½ inches long, the price varying from $8 to $12.

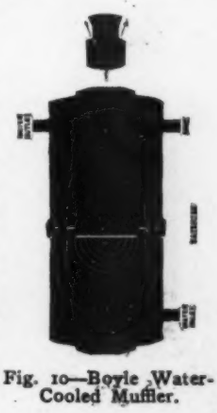

Fig. 10—Boyle Water-Cooled Muffler.

Fig. 11—Phelps' Trouble Finder.

Phelps' Trouble Finder (Fig. 11).—The New England Sales Company, 454 Old South Building, Boston, Massachusetts. This device, which is known as the first aid to the motor boat, consists of a fool-proof glass-covered spark gap which may be adjusted permanently to any spark plug within a few seconds. With the use of this trouble finder the spark which occurs within the combustion chamber is duplicated before the eyes of the operator, and ignition trouble is located by simply looking at this spark gap. The extra gap is said to intensify the spark within the combustion chamber and this keeps the plug free from ordinary collections of carbon, thereby increasing the efficiency of the motor and making it possible to throttle down to much lower speeds. These trouble finders are sold in sets of four, and the price is $4.00 for the set.

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Fig. 12—Indian Spark Plug.

Indian Spark Plug (Fig. 12).—American Machine Company, Eau Claire, Wisconsin. These plugs have no bushing on the top, so that the frequent breaking of insulation caused by tightening is avoided. With these plugs the bushing is placed at the lower end, where it serves the double purpose of supporting insulation and acting as a protection for the core against the oil, soot and heat from the cylinder chamber. In addition to the pipestone core insulator a pipestone collar is used around the shoulder of the plug, which acts as an insulator and at the same time serves as a protector for the upper end of the insulation core. The pipestone that is used is the same material that has been used by the Indians for centuries as material for pipes and curios, and is said to possess all the good qualities of porcelain and mica without any of their objectionable features.

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Fig. 13—Quick Action Battery Connector.

Quick Action Battery Connector (Fig. 13).—Excelsior Supply Company, 233 Randolph Street, Chicago. These battery connectors are made of one piece of annealed copper permanently insulated. The opening on either end is a slot, making attachment to the battery post easy and quick and having a turned-up point which will prevent the connection being broken if the nut backs off. The covering of the connector is white, and stiff enough to allow the name of the dealer being printed upon it if desired. They are low in price, and upon lots of 3,000 or more the makers will print the name of the buyer without extra charge.

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"Instint" and "Lustrogen" (Fig. 14).—Perry-Austin Manufacturing Company, Grasmere, Staten Island, New York City. The first of these two new products is a varnish and paint remover which is said to possess the ability to get rid of more paint or varnish in less time than by the use of any other known method. "Lustrogen" is a ready mixed aluminum paint which is designed especially for uses where the exposure will be severe. It is said to possess great wearing qualities and is always ready to use without further mixing.

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Fig. 14—"Instint" Varnish and Paint Remover.

Osburn Coils (Fig. 15).—Osburn Electric Company, 71 Fort Street, East, Detroit, Michigan. The type O of standard box coil shown herewith is especially designed for marine use and consumes but a small amount of current. This coil is equipped with a new vibrator which is fast and efficient, and it is said will not get out of adjustment under the most trying conditions. The boxes are made of seasoned mahogany or oak, finished with a special waterproof varnish. They are made ordinarily in two-cylinder types, but can be furnished with four terminals if desired. The coil uses from .3 to .4 of an ampere per hour to give a hot, snappy spark. The price with an oak box is $5.50 and $10, and with a mahogany box $6 and $11 for one or two cylinders, respectively.

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Fig. 15—The Osborn Coil.

Rhoades Unit Spark System (Fig. 16).—The New York Coil Company, 338 Pearl Street, New York. It is said that with the use of this spark system an extraordinary amount of current enonomy results, and since the device cannot stop in contact, there is no chance of the battery becoming run down. It has but one adjustment and only four moving parts in its entire construction, and the system can be installed in one hour's time. An especially desirable feature is the fact that the engine can be started without cranking, and therefore it combines the desirable features of both battery and magneto. A special outfit is furnished for one and two-cylinder engines, which require no distributor. The price of this system, including a coil, is $30 for a four-cylinder outfit and $20 for a two-cylinder outfit.

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The Weelite Trouble Lamp (Fig. 17).—A. S. Morss Company, 210-12 Commercial Street, Boston, Massachusetts. This hand lamp consists of a well-protected Tungsten bulb which operates on a few ordinary dry cells or from the storage battery or magneto. The outfit is made of brass, and there is nothing to rust or corrode. All parts are interchangeable, and the lamp may be shut off or on by simply turning the handle. The price of the lamp with extension cord is $2.50, and extra bulbs of either four, six or eight volts may be procured for 60c. each. Ordinarily the lamp is equipped with a six-volt, four-candle-power bulb.

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Willard Safety Lock Switch (Fig. 18).—The Willard Storage Battery Company, Cleveland, Ohio. This switch was placed upon the market to fulfill a demand for a cheap cut-out switch which would effectually prevent tampering with the electric installation of a motor. The switch is operated by means of a slotted key and cuts out the entire system from the source of current supply. The switch will carry six amperes and sells for $1.40.

* * *

Point Spark Plug (Fig. 19).—The Point Spark Plug Company, Aberdeen, South Dakota. These plugs have a number of special features, one of the most important of which is the fact that they will take care of any amount of excessive lubrication without becoming fouled. The construction of the central electrode and outer shell is such that if carbon should form upon one set of points the spark will jump from the other set, but since carbon is only a partial insulator, some of the electricity will pass through the partial shunt and burn off the carbon, leaving both sets of points ready to spark again. It will be noted from the illustration that the outer shell and central electrode have such a construction that if oil strikes them it will form by capillarity between the lower portions, leaving the points free to spark both above and below. This action is positive, and it is said that no amount of oil will stop the passage of the spark. The price of these plugs in both standard and metric sizes is $1.50.

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Perfex Safety Switch (Fig. 20).—Electric Goods Manufacturing Company, Canton, Mass. This switch is designed to prevent accidents, and with this in view the contact points are arranged in a manner different from that usually found upon switches. The off position is at the extreme left, the battery point in the center, and the magneto contact to the extreme right. Double-leaf contacts are designed to make perfect contact, and all connecting screws are placed in metal inserts which are firmly imbedded in the heavy base of the switch. The switch arm, which is ball bearing, cannot be removed except when in the off position, and all metal parts are nickel plated.

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Norbrassco Hardware (Fig. 21).—Norwalk Brass Company, Norwalk, Connecticut. As will be noticed from the illustration of the air port, this company takes great pride in the finished appearance of its work. These air ports have a ring on the outside of the collar, so that no matter what the depth of the inside finish between the ceiling and the side of the deck house, this collar covers that space, and the ring covers up the edge of the woodwork, making a finished job on the outside of the cabin. These ports are made in all sizes from 5 inches to 10 inches, with a collar of any depth up to 3 inches.

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Monoplex Electric Horn (Fig. 22).—Atwater-Kent Manufacturing Works, Philadelphia, Pennsylvania. This new electric horn is made of brass having a black enameled base, and contains a 5-inch diaphragm which is vibrated by an electric magnet. The horn itself is 11½ inches long and may be attached to the deck or coaming by means of a bracket which is cast in one piece with the base. This instrument is operated by means of a push-button placed wherever convenient, generally upon the steering wheel. The horn is always ready for use, and by the turning of a screw the strength of its note may be varied to suit the needs of the operator. Current for its operation may be supplied from dry cells, storage battery or charging dynamo, and yields the best results on from six to twelve volts.

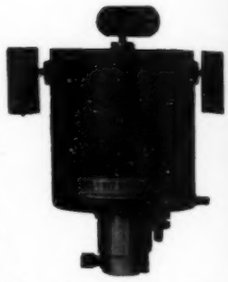

Fig. 16—Rhoades Unit Spark System.

Fig. 17—The Weelite Trouble Lamp.

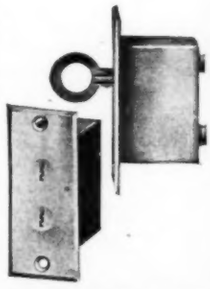

Fig. 18—Willard Safety Lock Switch.

Fig. 19.—The Point Spark Plug.

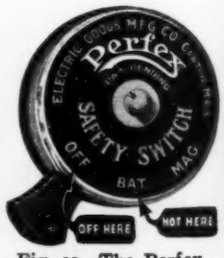

Fig. 20—The Perfex Safety Switch.

Fig. 21—Norbrasco Air Port.

Rubber Coating.—The Rubber Coating Company, 760 Congress Street, Portland, Maine. This company are manufacturing a line of rubber coating varnishes which are peculiarly suited for marine use, inasmuch as they are said to hold their color indefinitely and moisture or drouth will not change them in any way. These varnishes are not sticky and will dry hard within twenty-four hours under all atmospheric changes. They are sold in all sizes from a two-ounce can at 10c. to a one-gallon can at $3.50, and special prices are made upon case lots.

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Webster-Milton High Tension Magneto (Fig. 23).—Webster Electric Company, Tiffin, Ohio. The straight bar magnets used in the construction of these magnetos are made of magnet Tungsten steel and the timer blade is of clock spring steel. All shafts are mounted on German ball bearings, and the iridium-platinum points are of ample dimensions. These machines will start with a one-quarter turn of the crank, and if desired can be started from the switch if there is a charge in the cylinder the same as with a battery. These magnetos run at half the speed of the engine and will allow the motor to run as slow as possible and still produce a spark.

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Palmer Detachable Sparker (Fig. 24).—Palmer Brothers, Cos Cob, Connecticut. All working parts of this new detachable make-and-break sparker are made of hardened steel, and it is said that this attchment will spark perfectly on a two-cycle engine running at 1,000 revolutions per minute or on a four-cycle running at 2,000. Time changing is done by moving the lever shown on the left side of the cut. This lever is made so that it can be run across the top of multi-cylinder motors from one sparker to another, thus changing the time on all cylinders at once. Only one spring is used on this sparker, and the whole outfit can be removed for inspection or repair in a short time by taking out two bolts.

* * *

Combat Magneto Battery.—The Hall Storage Battery Company, Cleveland, Ohio, and Fulton-Zinke Company, Chicago, Ill. This new type of battery is designed for use in conjunction with a magneto for starting the motor on the spark or for use as an emergency battery. The feature which makes it especially appeal to motor boatmen is its compactness, since it occupies less space than two dry cells and weighs less than 7 pounds. The regular Combat hard porous plates with non-slopping vents and non-corroding terminals are used. This battery is made in both 4 and 6-volt sizes, listing at $10 and $13, respectively.

* * *

Ball Multi-Spark Plug.—The Ball Multi-Spark Plug Company, 202-208 South First Street, Aberdeen, South Dakota. These plugs derive their name from the shape of the central electrode end, which is about 3/8 of an inch in diameter and shaped like a ball. A multiplicity of sparks jump radially between the ball and the inner edge of the shell which surrounds it. The end of the body is semi-circular in cross section, thus presenting two rounded surfaces to each other. It is claimed that the use of these surfaces positively avoids any possibility of preignition through some of the spark plug parts becoming incandescent. The annular passage about the ball serves as a communicating throat in which it is impossible for any short-circuiting material to lodge.

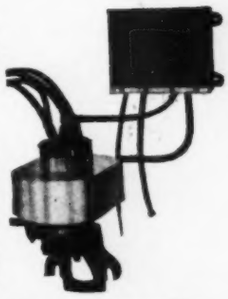


Fig. 23—Webster-Milton High Tension Magneto.

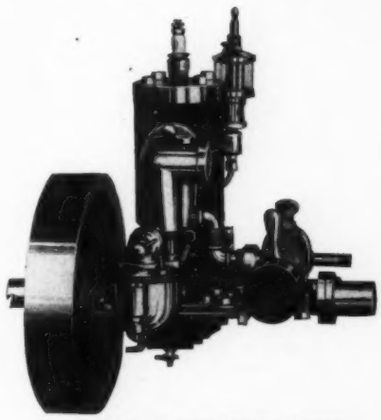
Fig. 22—Monoplex Electric Horn.

Fig. 24—Palmer Detachable Sparker.

Motors for Motor Boats.

The Brownie Canoe Engine.

The engine which we show herewith is a special canoe engine built by the B. V. Brown Gas Engine Company, of Syracuse, N. Y. Although this company make engines of all sizes and for many different uses, they are calling special attention to their 1910 models of canoe engines, which are made in two sizes of one or two cylinders, capable of developing one and two horsepower, respectively. These little engines are exact reproductions of the larger sizes and are as complete in every respect. They are of the two-cycle, three-port type, having detachable cylinder heads, water-cooled exhaust, and a ball contact timer. The regular equipment of these canoe engines is the same as that of the larger sizes, except that they are made with aluminum bases, although bronze bases and balance wheels may be used if desired. The single-cylinder motor of this type weighs 35 pounds, and the double-cylinder weighs 50 pounds with an aluminum base.



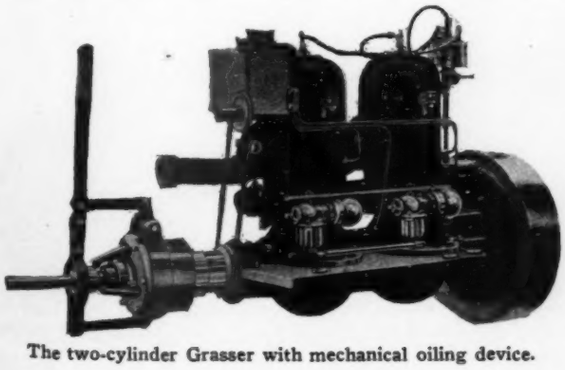
Brownie single cylinder for canoes.

The Holliday Fisherman's Special.

The Holliday Engineering Company, of Chicago, in response to a demand for a fisherman's special outfit, have placed on the market a newly designed single-cylinder, heavy-duty motor and reverse gear in one unit. The purpose of this outfit is to furnish steady, reliable and continuous power under all conditions and is intended primarily for heavy boats used by coast fishermen. The motor develops six horsepower at 350 R. P. M. and has a 6 5/8-inch bore and a 7-inch stroke. The pistons have four rings, crank shaft and bearings are of carbon steel, and the valves are mechanically operated, of extra large diameter, with cams and rollers entirely enclosed in a compartment filled with oil. The first consignment of these motors was sent to Australia, where they will be installed in a fleet of fishing vessels.

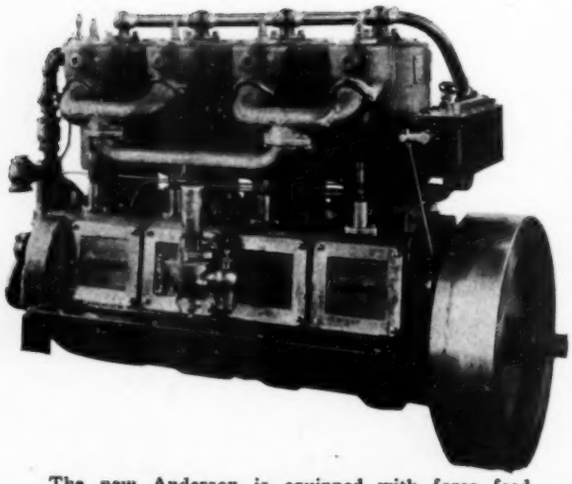
Grasser Marine Motors.

These motors, which are built by the Grasser Motor Company, of Toledo, Ohio, embody a number of original features, foremost among which is the combination two-port, three-port in all cylinder sizes of 4 3/8-inch bore and over. With this arrangement, of which this company are the originators, it is claimed that from 20 to 35 per cent. more power is attained from the same bore and stroke than with any other motor. It is said to have all the advantages and none of the disadvantages of both the two and three-port motors. These engines are built in various sizes from 2 to 40 horsepower, the larger sizes being made with aluminum crank cases if desired. The ports are placed in the forward and after sides of the cylinders in all except the smallest size.



The two-cylinder Grasser with mechanical oiling device.

Holiday Fisherman's Special with reverse gear on engine frame.



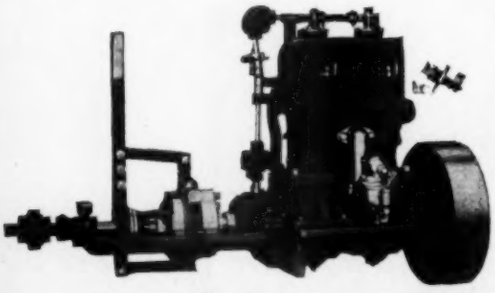
The new Anderson is equipped with force feed lubricator and Schabler Carburetor.

The 1910 Anderson.

The 1910 model of the Anderson engine, manufactured by the Anderson Engine Company, of Shelbyville, Ill., illustrated herewith, is one of their most popular sizes, having four cylinders 5 inches by 6 inches. Both the intake and exhaust valves are exceptionally large and are arranged on opposite sides of the cylinders. They are interchangeable, made with nickel steel heads and are mechanically operated. The water jackets of these motors are cast integral with the cylinders and no gaskets are necessary. The gears and push rods are all inside of the base, but so arranged that they may be easily removed if necessary. These engines are equipped with Schebler carbureters, and mechanical force feed lubrication supplies all the bearings and cylinders. The cooling system is governed by a circulating pump of the plunger type of extra large size. All of these engines are of the jump-spark type.

New Ignition on Lackawanna Motors.

The Lackawanna Manufacturing Company, of Newburg, N. Y., have recently placed a new type of ignition upon their motors which is believed to be simpler than most of the two-cycle igniters, since it has no trip rods, oscillators, rocker arms or eccentrics. The igniter plug, which will be seen on the right of the illustration, fits at once into the cylinder head and is easily removable without disturbing other parts. Electrodes are of nickel steel having special igniter points, insuring freedom

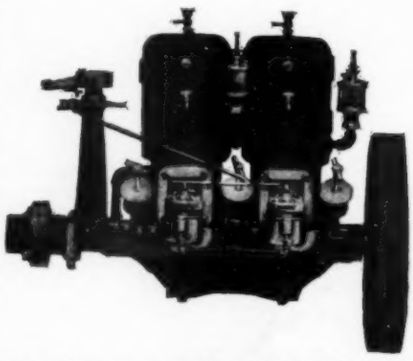


A two-cylinder Lackawanna showing the new ignition device.

from rust and clean electrical contact at all times. The trips and the plugs are operated by a disc shaft carrying a simple tripping disc, which may be seen at the left of the ignition plug. The control lever advances or retards the action of the tripping discs to increase or decrease the speed of the motor. This ignition device has few parts and needs only two wires for any number of cylinders. Lackawanna make-and-break motors may be changed to jump spark or the jump spark may be changed to make-and-break at any time with very little trouble.

The Model "S" De Mooy.

We show herewith a cut of one of the latest engines built by the De Mooy Brothers, of Cleveland, Ohio. These engines are said to operate equally well on kerosene, alcohol or the heavy hydrocarbons, but must be started with gasoline. Some of the original features of these engines are an auxiliary air valve which is claimed to save gasoline, and at the same time to result in the development of 10 per cent. more power than is possible without it; a double oiling system making lubrication positive, and adjustable crank-shaft bearings. The De Mooy engines are operated as combination two and three-port engines, with the difference that air only passes through the third port, a fact which has been stated to be a practical saver of gasoline. When the engine is in operation the auxiliary air valve is open and air only is allowed to pass through the third port, which is opened by the piston when nearly



The Demooy uses either alcohol, kerosene or crude oil.

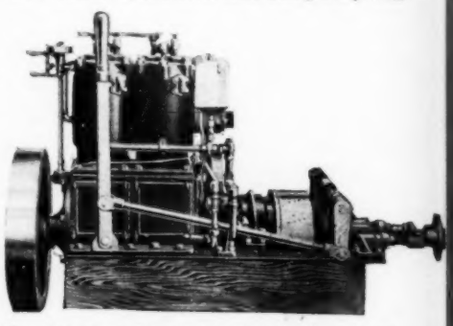
at the end of the up stroke. This air mixes with the charge already drawn into the crank case, making a mixture rich in air and giving a higher pressure at the explosion point than before the port was opened.

The 1910 Lamb Engines.

One of the latest improvements to the line of engines manufactured by the Lamb Boat & Engine Company, of Clinton, Iowa, is a new method of distributing the lubricating oil. Instead of pumping the oil from the crank case of the engine to a reservoir to be fed by gravity or force feed to the bearings, the reservoir and gravity feeds have been entirely done away with, and in their place is a distributing plunger pump. This pump is located on the after end of the crank case and delivers to each crank-shaft bearing a proportionate amount of oil at each stroke of the pump. All excess oil is thrown off by the whirling of the crank, thereby lubricating the cam movement and the cylinders. The oil not so used drops back into the crank case, where it is strained and pumped over again. This company are manufacturing four-cycle motors of two, three, four and six cylinders from 12 to 80 horsepower.

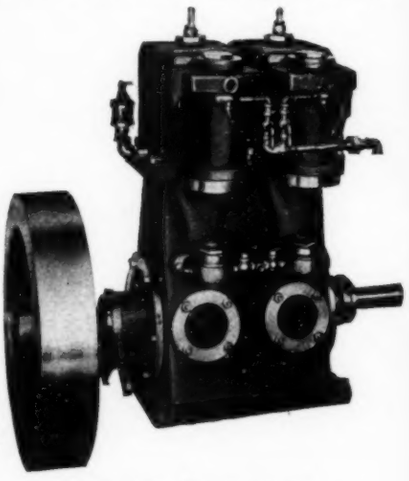
The New Shortt Motor.

Herewith is shown one of the two cylinder models for 1910. These motors are unique in several respects. Instead of being sucked into the cylinder the fuel and air are forced into the combustion chamber, thus doing away with



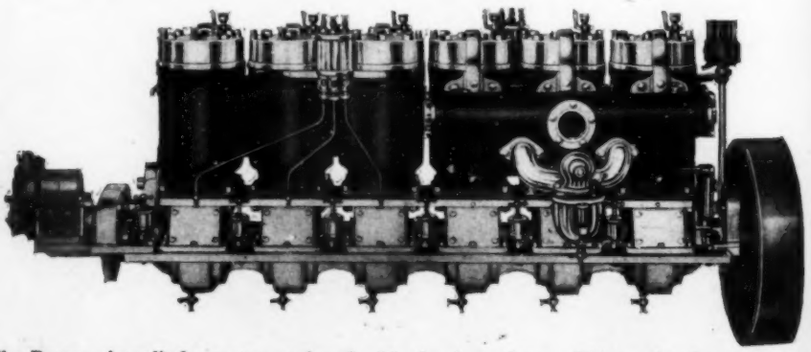
In the new Lamb the lubrication is accomplished by means of a plunger pump.

the carbureter. By an interesting valve arrangement and a cleverly constructed piston head which produces a vacuum between itself and the cylinder wall, as it descends, a scavenging of the cylinders is obtained, equal to that in the four cycle type of motor. It is claimed that the engine will run equally well on either gasoline or kerosene and at speeds ranging from 150 to 2000 r. p. m. There are no cams or glaring and but few



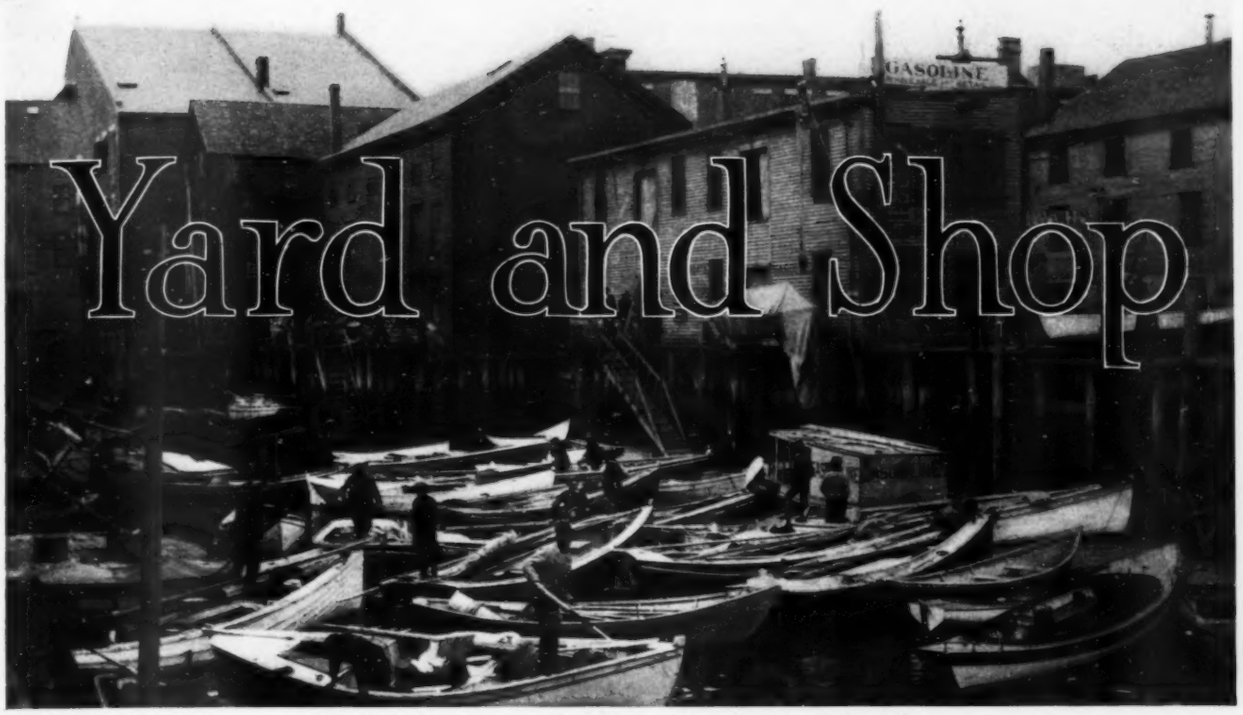
The New Shortt Motor

moving parts. The exhaust ports completely encircle the cylinders and are much larger in area than in the ordinary two cycle motor. With all its advantages the Shortt motor is extremely simple in construction and operation and has thoroughly proved the claims made for it.



The Brown six-cylinder motor equipped with aluminum base. This engine is of the two cycle, three port type, weighs 600 pounds and is rated at 60-80 horsepower.

Yard and Shop



Gasoline fishing dories waiting for fuel at a station in Portland, Me.

The Valley Boat and Engine Company, manufacturers of boats and knock-down frames, removed on April 1st from Baldwinsville, New York, to Saginaw, Michigan.

E. S. Lincoln, of 132 Summit Avenue, Brookline, Mass., has called our attention to the fact that the Aaron automatic pump, described on page 45 of the March issue of MOTOR BOATING, is handled by Mr. Lincoln, rather than by the J. F. Kennedy Company as was stated.

The Marine Equipment and Supply Company is a newly incorporated concern, located at 55 N. Seventh Street, Philadelphia. The officers are: President, B. L. Gray, who was formerly connected with the Fairbanks Company; treasurer, G. S. Ruland, formerly superintendent of the Girard Iron Works of Philadelphia; and secretary, H. H. Vail, formerly with the Fairbanks Company. It is the intention of the new concern to carry a complete line of equipment for boats, such as marine hardware, engines, electric lighting outfits, etc.

The Lackawanna Manufacturing Company, of Newburg, New York, have recently given their entire season's business to the Hydrex Silencer Exhaust Works, which is said to be the largest order for silencers ever placed. These silencers are of the latest type and make use of the vortex principle of handling exhaust gases from the motor through specially designed orifices which gradually increase in size, thus obviating friction in a manner similar to the handling of steam in the steam turbine.

The Ferro Machine and Foundry Company, of Cleveland, O., have recently closed contracts for an an addition to their new machine shops which will be completed by May 15th. The addition consists of a brick and concrete building 140x160 feet, and with the completion of this building the capacity of all the departments of the Ferro factory will have been trebled since last July. The entire cost of the recent additions will approximate $300,000, and the company now employs over 1,200 workmen.

The Connecticut Telephone and Electric Company, of Meriden, Conn., since they were first organized for the purpose of manufacturing long distance and interior telephone equipments, have branched very extensively into high grade electrical specialties, which are now being handled by their sales representatives, the United Manufacturers, of New York City. An addition to their plant is now being constructed in the form of a brick building 40x100 feet.

The Smith and Baldridge Machine Company, owing to a rapid increase in business, have increased their manufacturing facilities to a considerable extent. The floor space of their factory has been doubled, new grinding machines installed, and the assembling, packing and shipping departments reorganized in order to facilitate prompt shipment.

The Michigan Steel Boat Company, of Detroit, Michigan, have recently compiled some interesting figures as a result of their correspondence with owners and prospective purchasers of launches in all parts of the country. While the figures published are more or less of an estimate, it is fairly certain that at least 200,000 persons in the United States either own power craft now or will be owners before the end of 1910.

John P. Smith Company, of Nyack, New York, who have been confining their attention to the construction of boats over 50 feet in length, have enlarged their facilities and are now in a position to build boats of all sizes from 10 feet up.

The Anderson Engine Company, of Shelbyville, Illinois, have recently shipped a 5-horsepower motor to Norway, a 2½ and a 5-horsepower to Brazil, and a 37½-horsepower to Denmark.

The Washington Sportsman's Association was recently formed in Washington, D. C., and a show will be held by the organization from April 11th to 16th in the Fifteenth Street Armory.

The Standard Gas Engine Company have opened general offices and salesrooms at 10 California Street, one block from the Market Street Ferries, San Francisco, Cal.

The Newburg Reed Company, of Newburg, New York, manufacturers of weatherproof wicker furniture, have changed their firm name to the Wicker Craft Company and will continue business with Mr. H. S. Pratt as president.

The Manhattan High Power Marine Company is a newly organized corporation for the manufacture and sale of motors, motor boats and supplies. The company is capitalized at $300,000 and the incorporators are J. Treen, W. F. Reedes and C. C. Voorhees, all of New York City.

The Hartford Auto and Boat Supply Company, of Hartford, Conn., has filed a certificate of incorporation and is authorized to issue capital stock of $50,000 and to begin business with $4,000 of paid-in capital stock. The incorporators are T. E. Oakes, W. J. Rabbitt, and G. J. Stoner.

The Turbine Auxiliary Muffler Company, of New York, recently had an official test made of their auxiliary muffler, fitted to a 12-horsepower, two-cylinder Bridgeport motor, and the report shows that while the exhaust of the the engine was effectively muffled, the engine at the same time developed approximately 25 per cent. more power.

The American Exposition, which was to have been held in Berlin during the coming summer, has been postponed until 1911 owing to an apparent opposition which has developed in Germany against the exposition. The majority of the members of the Executive Committee are planning to visit Berlin this summer and it is thought that the exposition will be a German-American affair with both countries participating. Therefore the United States Government has been requested to continue the Honorary Commission appointed last summer.

The new home of the Toppan Dories at Medford, Mass.

For the Motor Boatman.

(*Continued from page 47.*)

Hydro-Tele-Motors. Hanchett & Dannheiser, 237 Fulton Street, New York. This new steering gear is of the self-equalizing type and enables a boat to be steered like an automobile. The outfit consists of a hydraulic type of gear, consisting of two small curved pump cylinders, each of 2½ inches bore, which are actuated by the steering wheel. These cylinders communicate through seamless annealed copper pipe, having an outside diameter of about ⅜ of an inch for ordinary sized boats with two similar cylinders on the rudder stock. These cylinders and pipes are filled with a mixture of glycerine, alcohol and water, which is non-freezing. A distinct feature of this device is its simplicity and its provision for automatically taking up fluid enough to replace any leakage past the pistons so that back lash from the wheel is prevented. The use of this system does away entirely with tiller ropes and the pipes, being flexible and of small diameter, are easily led anywhere desired. The device is intended primarily for boats exceeding 25 feet in length and equipped with at least 10 horsepower.

* * *

Coleman's Liquid Copper. Liquid Copper Company, 85 Boston Street, Boston Mass. This liquid copper paint is especially useful inasmuch as it is easily applied and will not foul. It may be put on the boat and rubbed down with steel wool, and the resulting bottom will be one of fast seamless copper which will last for two seasons without any attention. This paint dries hard and it is said will keep a boat in much better condition than with the use of ordinary copper paint.

* * *

Columbian Yacht Rope. Columbian Rope Company, Auburn, New York. This rope is manufactured especially for use on private yachts and motor boats where fine appearance is second only to utility. Ordinary ropes serve the purposes required of them but upon boats of the better class a rope which looks well in addition to performing its duty will be appreciated. The ropes made by this company are of selected fibre of a bright color and exceptional strength. They are made in all sizes and a number of different styles.

* * *

Speed Motor Canoe. The Detroit Boat Company, Detroit, Mich. A speed canoe just placed upon the market by this company is 20 feet in length, made of cedar, copper fastened and is equipped with a two horsepower engine, giving it a speed of about ten miles per hour. The craft is graceful in design and is said to be an exceptionally dry boat. This model sells for $110 complete.

* * *

Cedar Boat Lumber. The Jordan Brothers Lumber Company, Inc., Norfolk, Va. These manufacturers of the Cedar Mooring Buoy, which was described in a previous issue, are now in a position to supply cedar boat lumber in all thicknesses and lengths. One of the first considerations in selecting a suitable boatboard is the weight, and when it is considered that a piece of dry white pine one inch thick and 12 inches square will weigh 2½ pounds, and a piece of dry cypress of the same size three pounds, the fact that a similar piece of dry white cedar will weigh but 1½ pound shows the advantage of cedar over the other woods for boat use. An additional advantage of cedar is the fact that it is easily worked, and owing to an oil contained in it does not easily absorb water. This lumber can be furnished in any thickness from 1 to 2½ inches, practically in any width, and from 12 to 20 feet in length.

* * *

Pyrene Fire Extinguisher. Pyrene Manufacturing Company, New York City. This extinguisher measures 3 inches by 14 inches and weighs 4 pounds. Pyrene, with which the extinguisher is filled, is a combination of powerful gases in liquid form which, when applied to a fire, are instantly converted into a heavy dense gas, extinguishing the flame without injuring surrounding materials. The liquid will not freeze, although it has been subjected to temperatures as low as 100 degrees below zero. The extinguisher thrown a continuous jet of Pyrene to a distance of about 30 feet, discharging one-half an ounce at each impulse of the piston in either direction. A few strokes will usually suffice to extinguish small fires and the remainder is good until used. The price of this extinguisher in the regular finish is $5 and in polished brass $6.

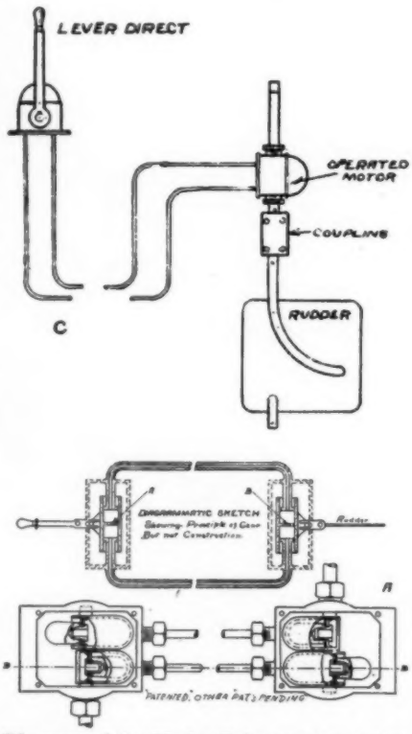


Diagram of the Hydro-Tele steering device.

* * *

Icy-Hot Jar. The Icy-Hot Bottle Company, Cincinnati, Ohio. This jar is constructed upon the same principle as the Icy-Hot Bottle and is for the purpose of keeping solid food hot or cold indefinitely. It has no neck, which makes it possible to remove the contents with a large spoon. The jar can be carried in the same leather carrying case as the quart bottle, and since it is shorter than the bottle a space is left between the top of the jar and the top of the case for carrying, napkins, cutlery, etc. This jar will keep ice cream frozen without ice and will keep meats and vegetables hot without fire, whichever way they are put into the jar.

A Home-Made Muffler.

(*Continued from page 44.*)

pipe which is one and a half inch in diameter.

This device works without any back pressure, does away with the spray blowing over the boat and muffles the exhaust so that it can not be heard fifty yards away.

The only objection to it is that the elbow and nipple project over the outside of the boat about four inches and a little care must be used when running alongside of dock or similar object on that side of the boat.

However, as the elbow points down and back it is not so great an objection as one might at first suppose, and the added comfort to oneself and friends overbalances it many times.

The number of quarter-inch holes that I should recommend for the various sized exhaust pipes are, 1 inch pipe, 25 ¼-inch holes; 1¼ inch pipe, 40 ¼-inch holes; ½ inch pipe, 50 ¼-inch holes; 2 inch pipe, 90 ¼-inch holes; 2½ inch pipe, 175 ¼-inch holes.

R. D. FAXON.

Hartford, Conn.

The Coming Season on Lake Michigan

(*Continued from page 7*).

holding ground in almost any storm, and plenty of depth. There are two hotels and a big time is promised the boys on their arrival. The ladies will be entertained also. There are a good many of the latter who take these cruising races, as owing to the fact that the race is mostly along the shore and as there is a harbor every fifteen miles, they are sure of a port in case of any need.

There will be a scattering of the boats here as they will return to Chicago by many routes. Some will cruise along farther north and others will go over to Green Bay and some will return along the east shore, taking the ports that they did not visit on their way up. In fact, the east shore is a fine cruising ground in itself and has many a fine little lake and harbor and some splendid fishing may be had.

The Charlevoix race will probably be held under the W. P. B. A. actual performance rule and the rating and handicapping will be according to past performances. The owner shall determine the boat's speed rating and specify the time on the entry blank.

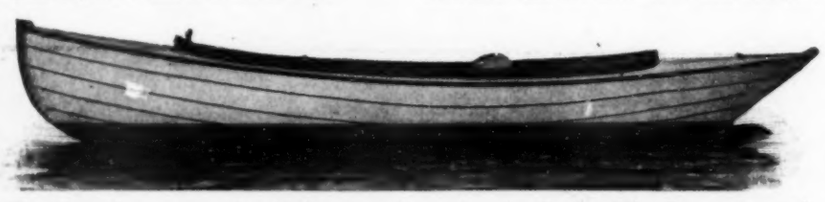
An owner may change the rating within twenty-four hours previous to the race.

The committee reserve the right to change a boat's rating if shown by available records that the boat has within sixty days previous to date of race made a higher speed than that given by the owner. Or if for any reason they are convinced that the owner's rating is too low.

There will be one more addition to the rule and a most important one, that every boat must carry a dinghey large enough to carry every member of the crew. If one is not enough two must be carried so that, in case it should be necessary, they can all leave the boat in safety. It is the aim of the club to provide every safeguard and the idea is a good one and should be insisted upon by all the clubs.

The earlier races were held under the 1905 A. P. B. A. rules and were both praised and sworn at. Later the actual performance rule was tried and this put some ten boats into Michigan City within ten minutes of each other, which is not so bad for a thirty-six mile race. Last year the W. P. B. A. rule was tried and this was also roundly abused by some, and as they are all cussed just about the same it does not seem to make much difference what the rule is.

The Lake Michigan motor boatmen have taken kindly to races of the cruising type. They are not anxious for any spectacular races but have gone in for races of the same sort, the kind that promotes good feeling and still provides good sport, the kind that will provide some play with the hard work. If this is accomplished it does not make much difference what the distance or what the port.



The Cape Ann power dory being turned out by the Cooley Mfg. Co., makers of the Cooley engines and spray hoods.

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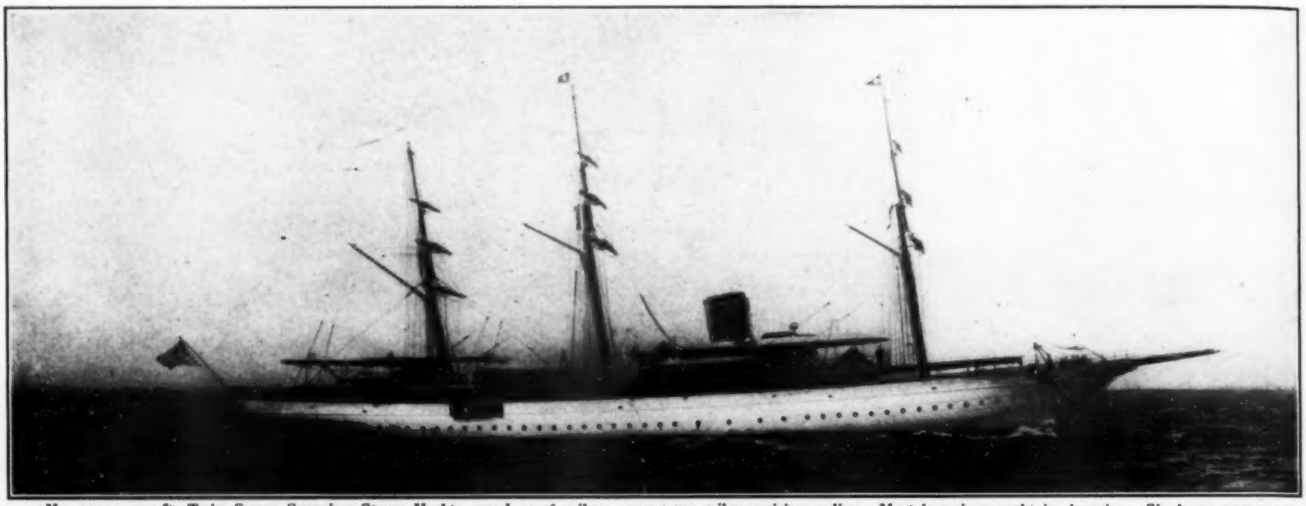

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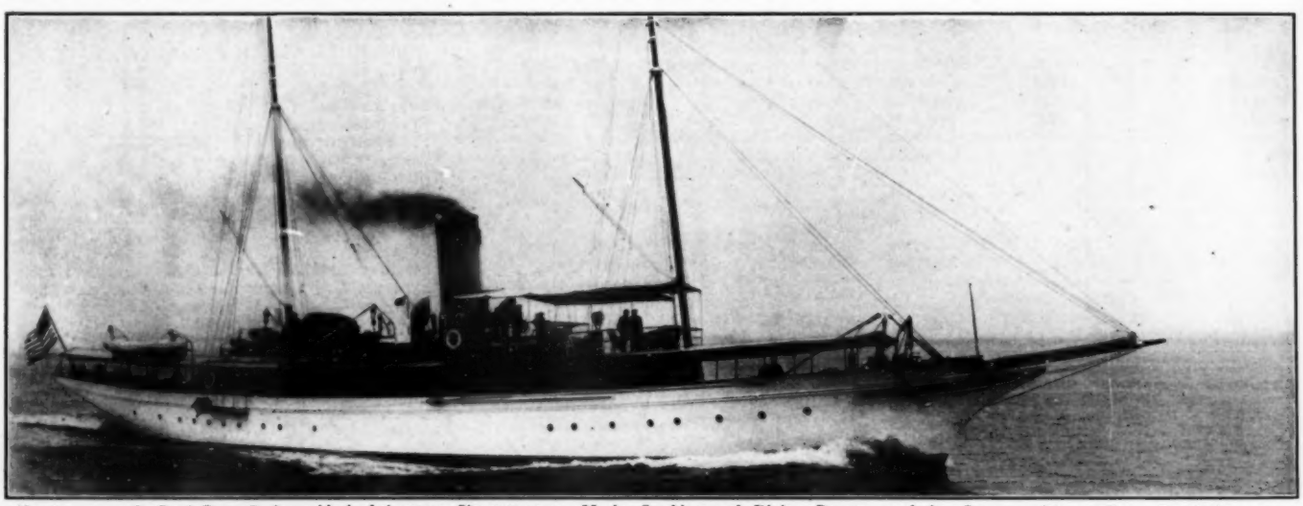

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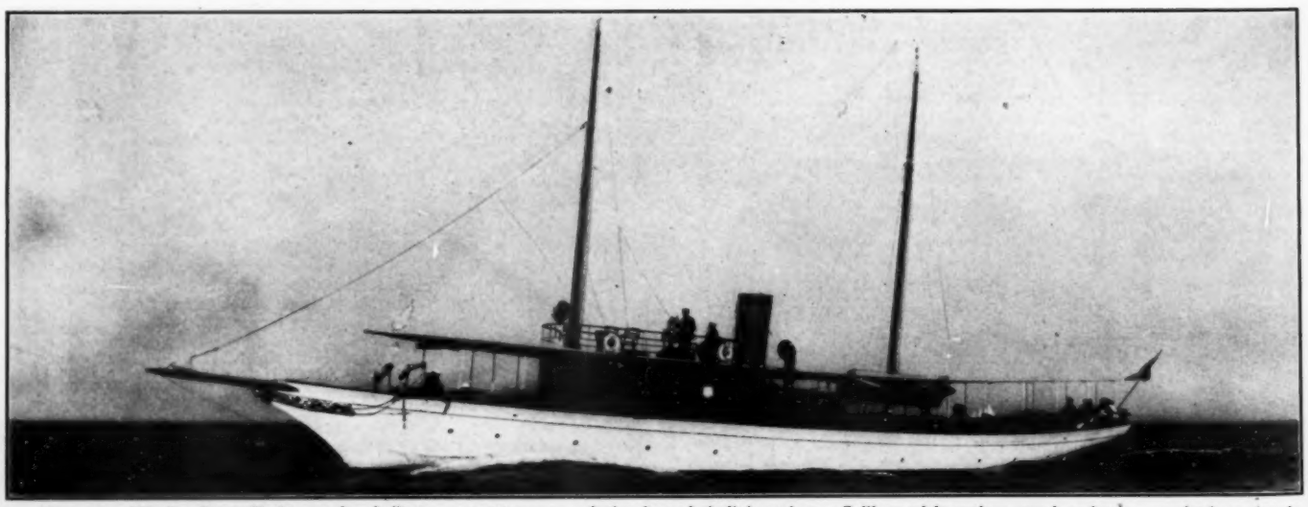

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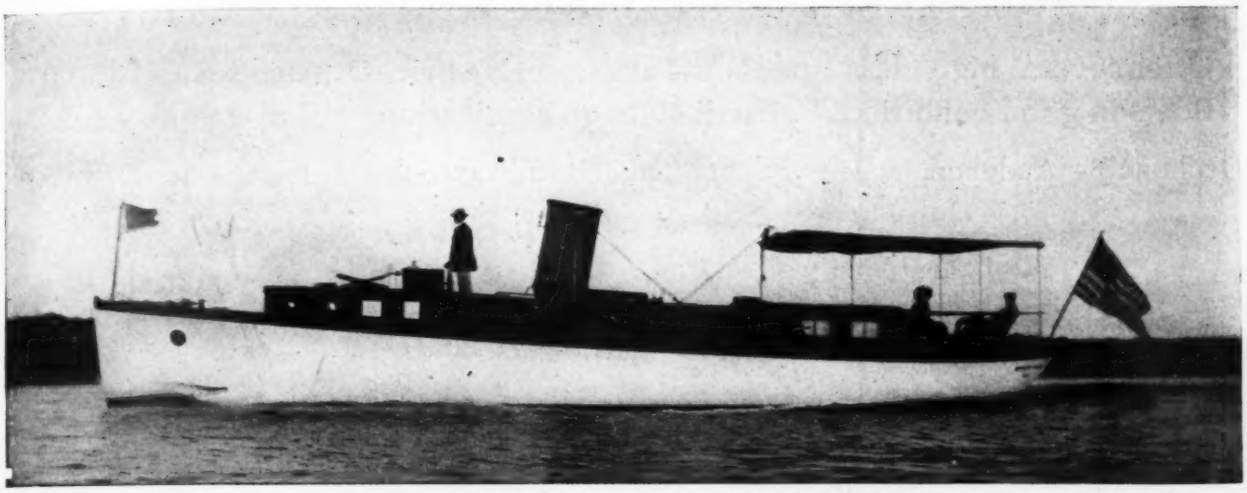

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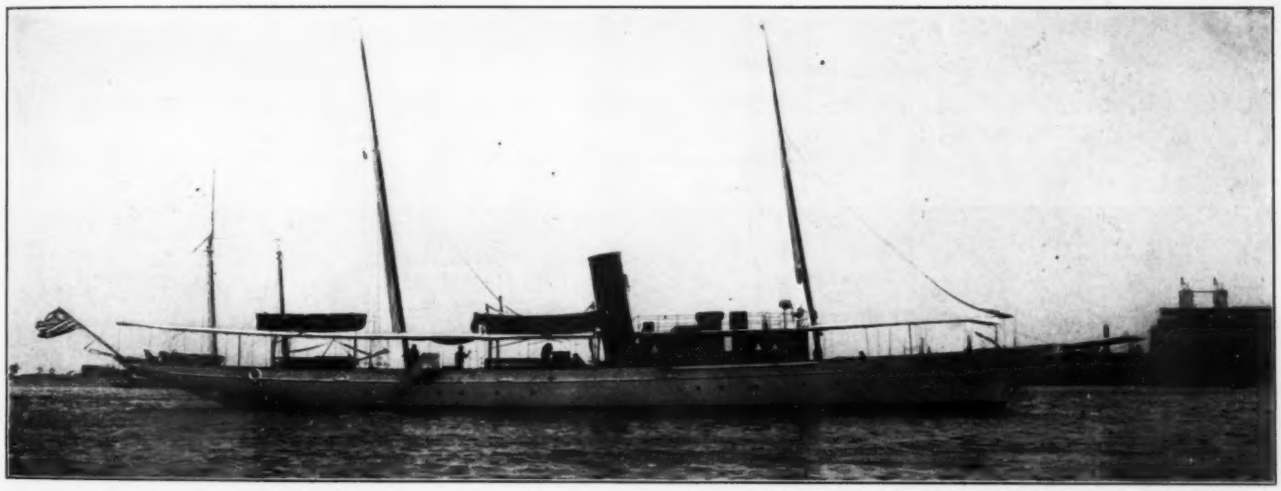

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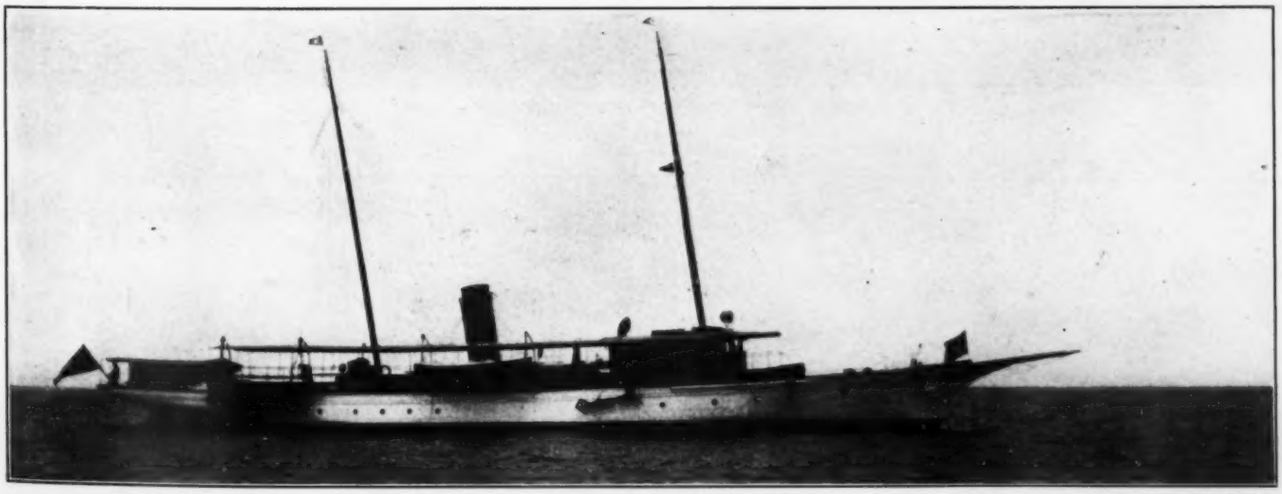

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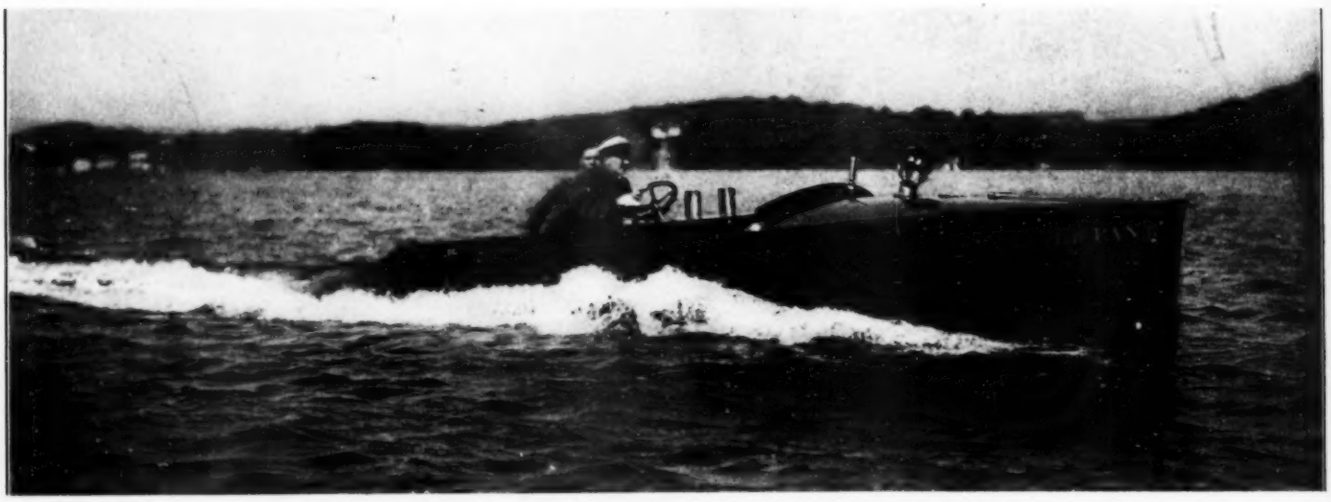

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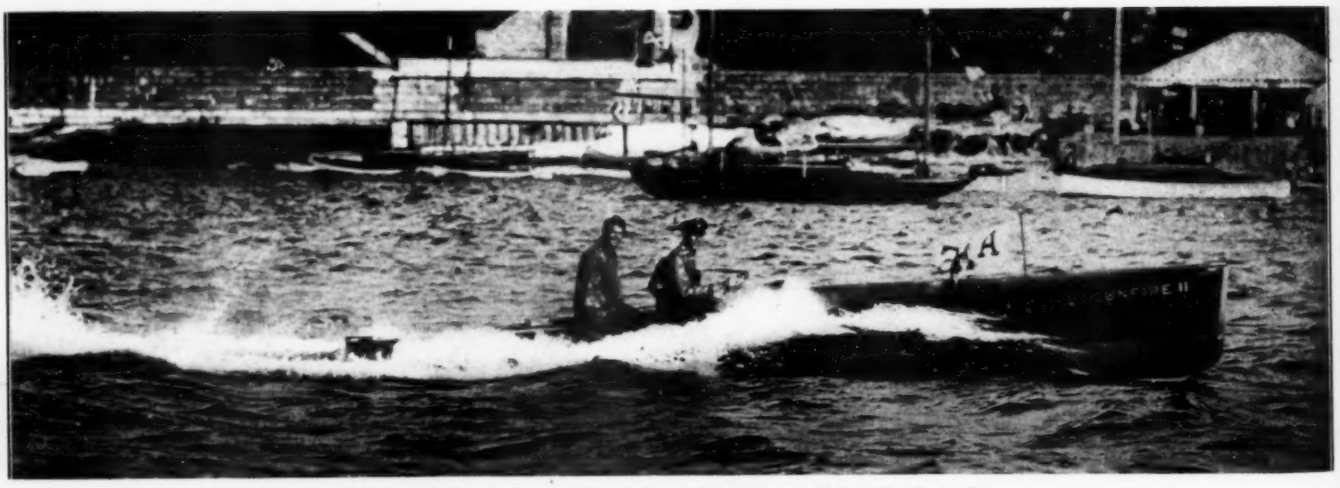

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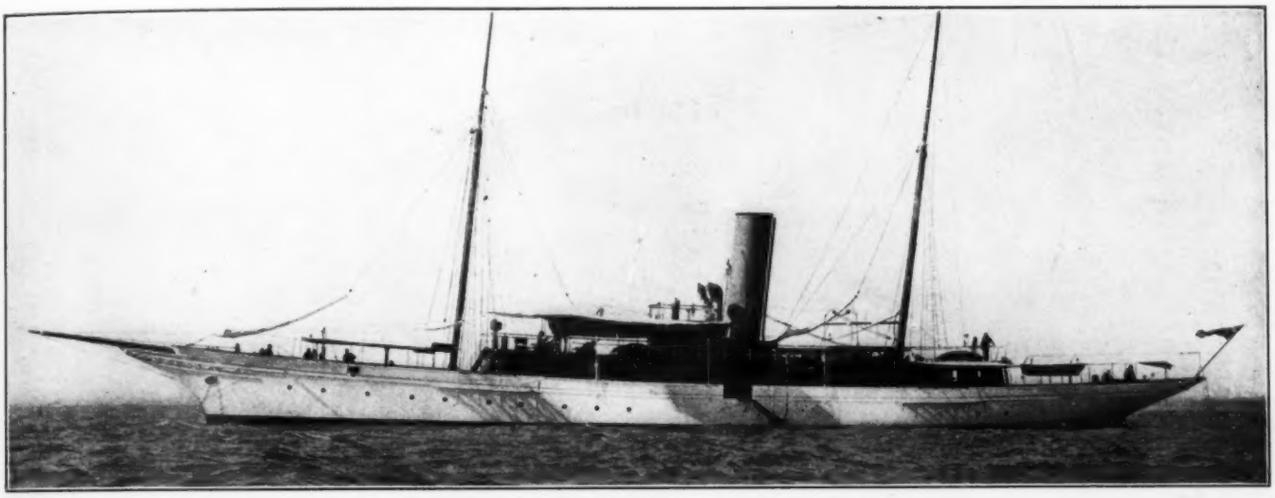

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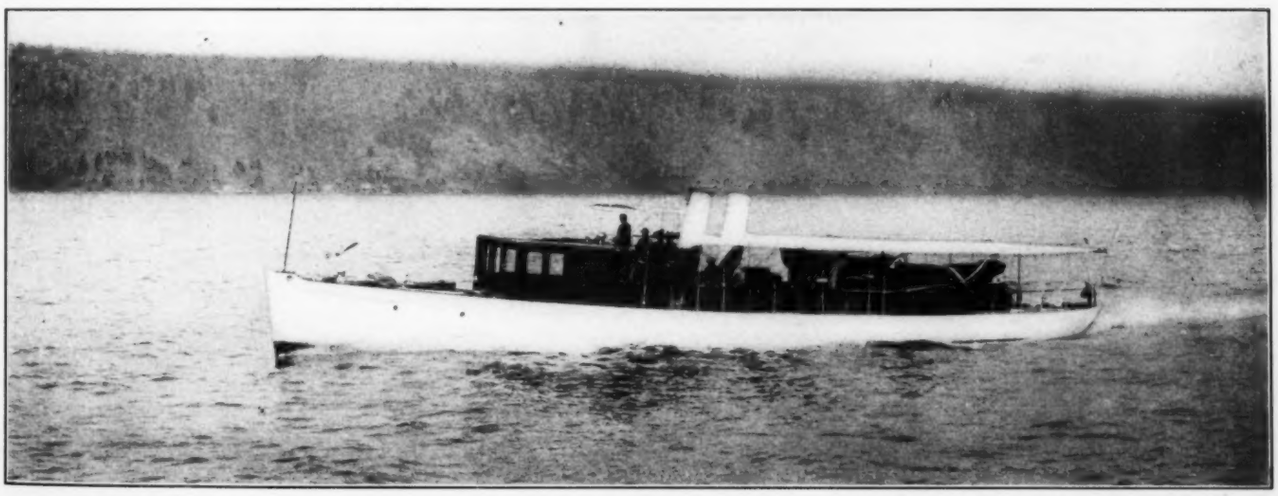

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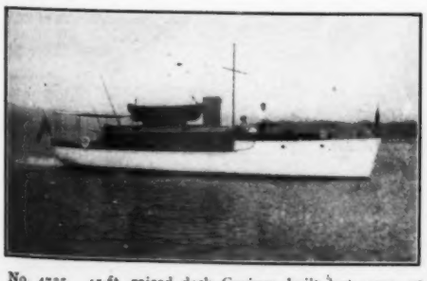
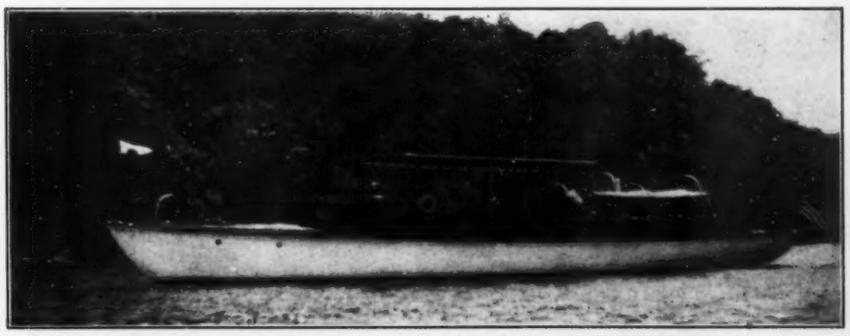


No. 4725. 45-ft. raised deck Cruiser, built last year; 25 H. P., 4 cylinder, 4 cycle motor.



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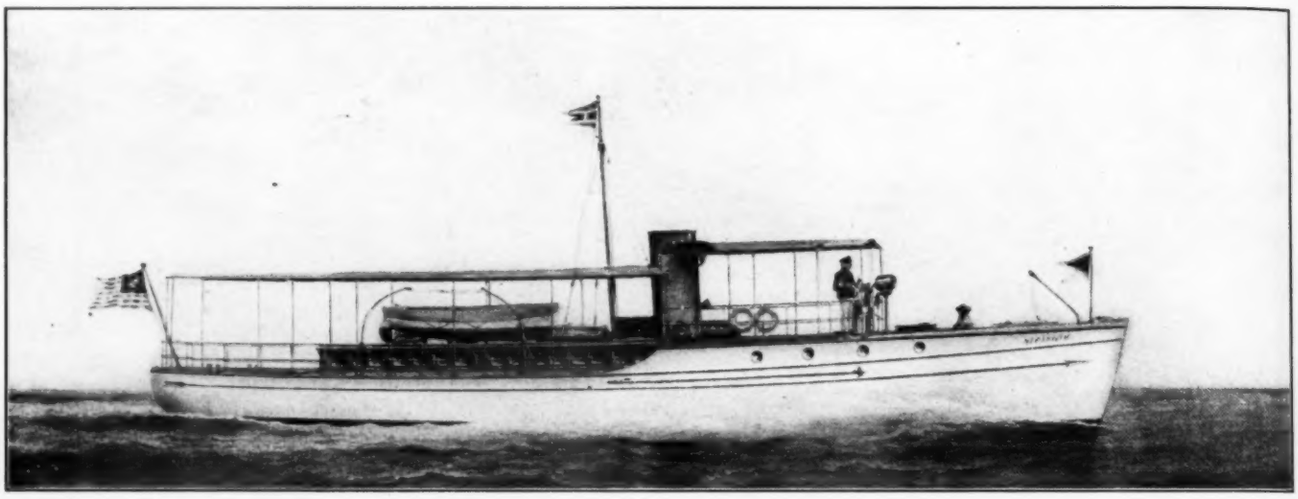

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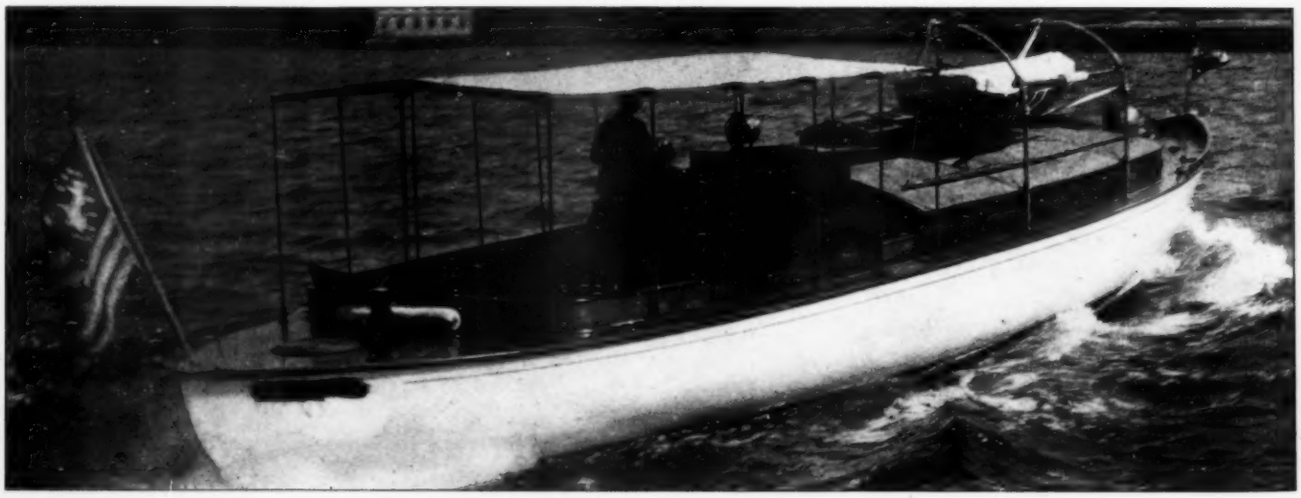

No. 1365. Bargain—62x12 ft. twin screw launch. Speed 13 to 14 miles.
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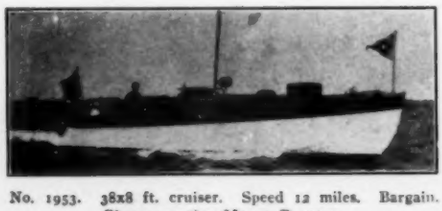

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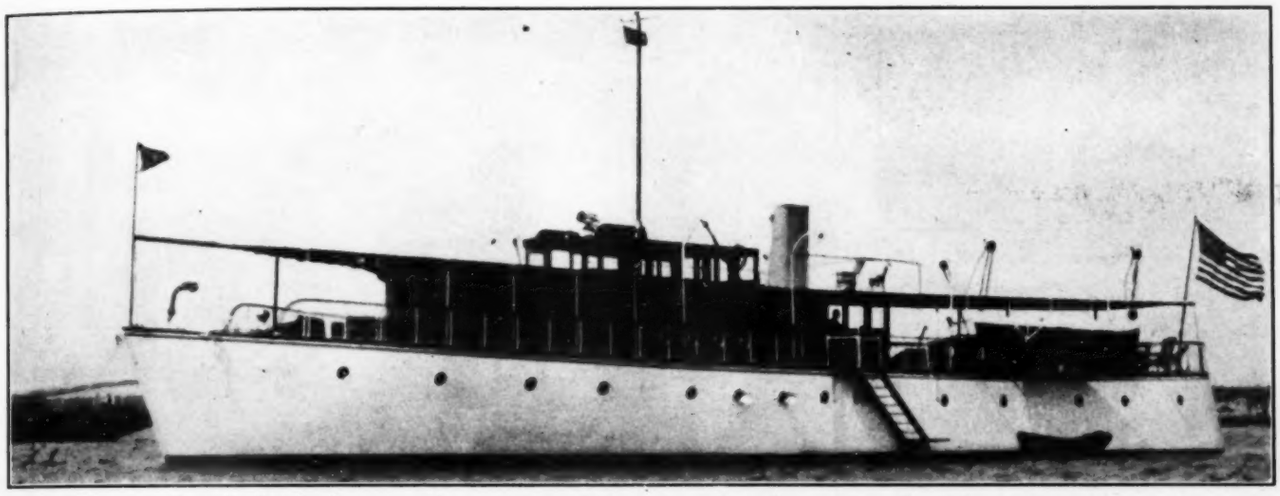

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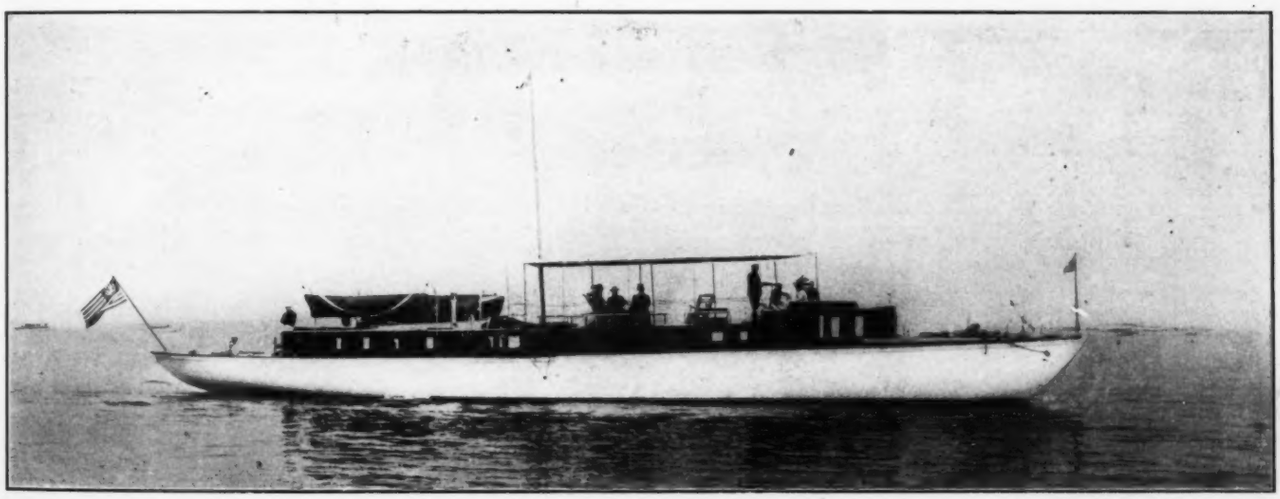

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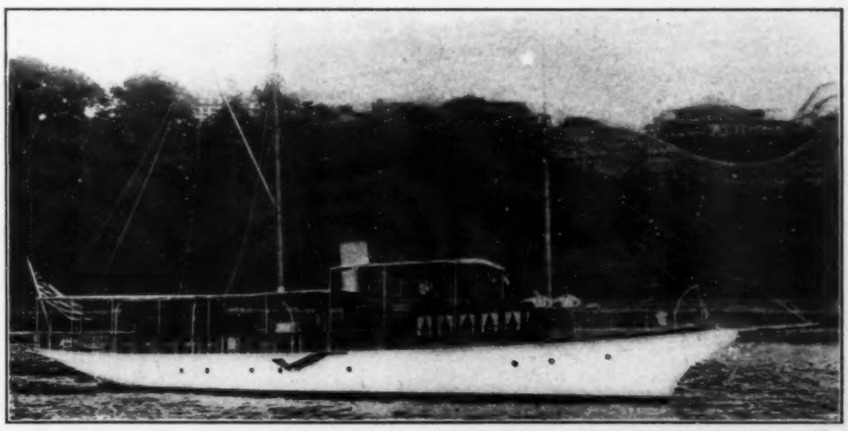

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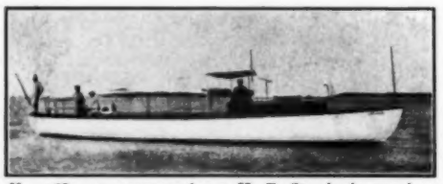

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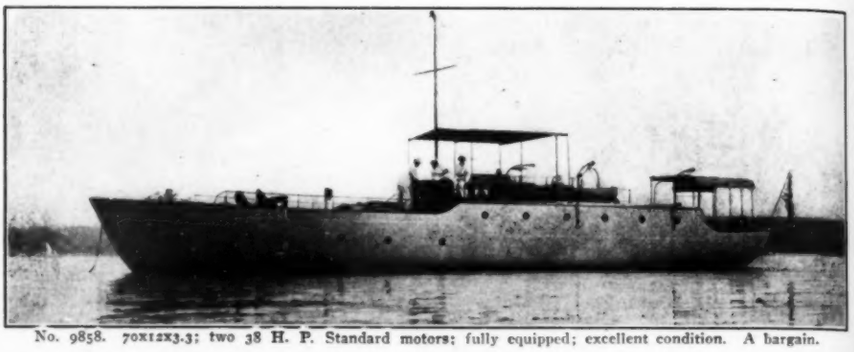
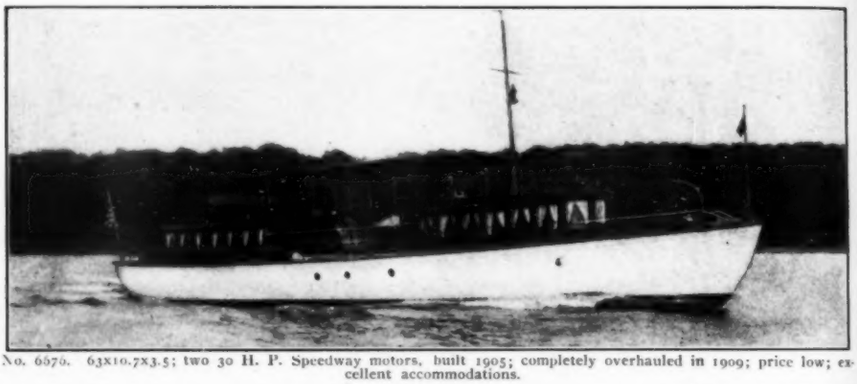


No. 9858. 70x12x3.3; two 38 H. P. Standard motors; fully equipped; excellent condition. A bargain.



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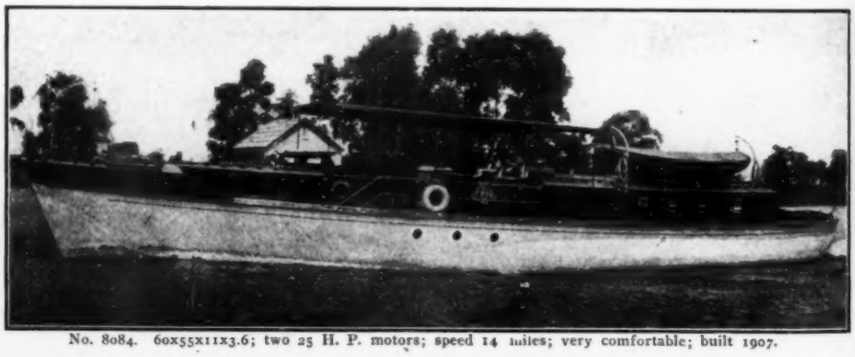

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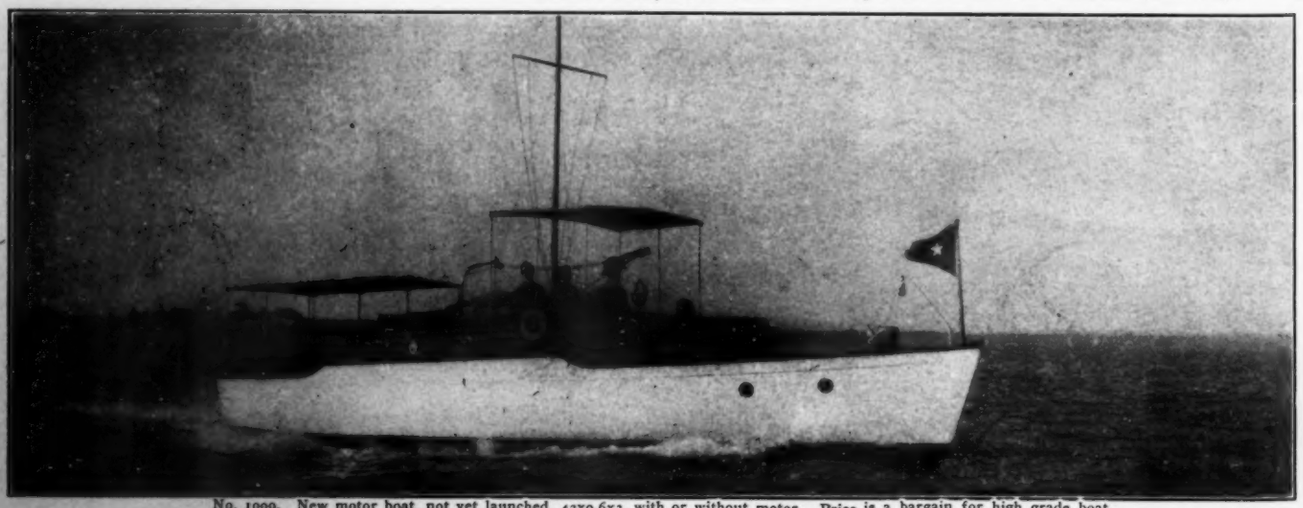

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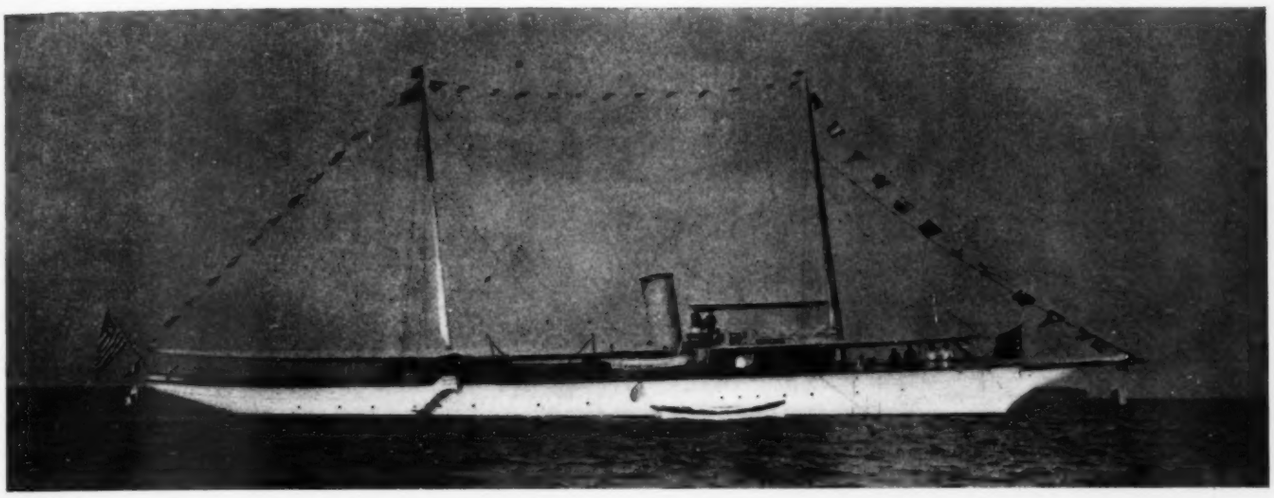

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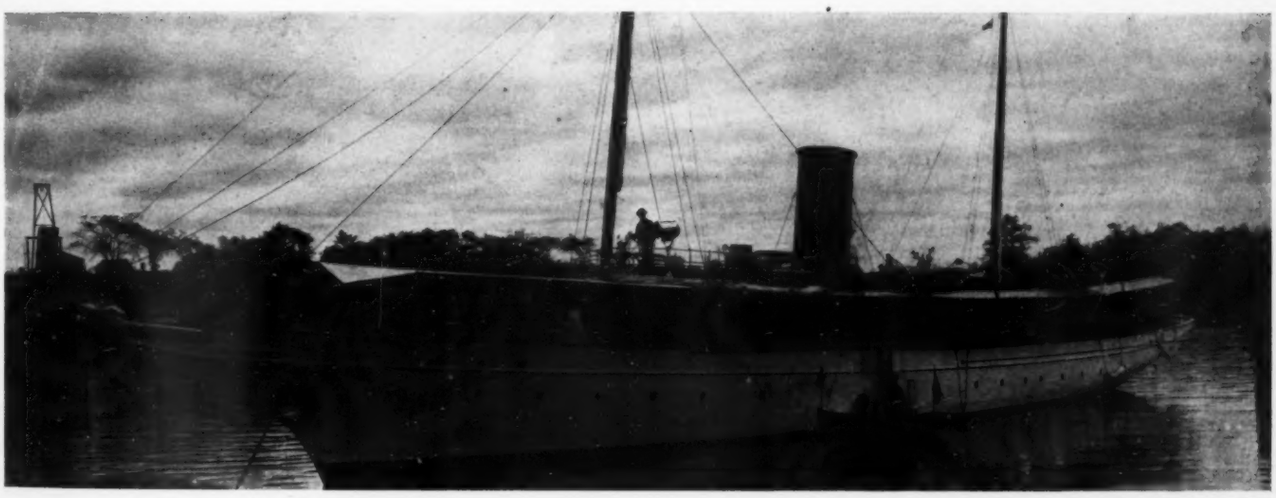

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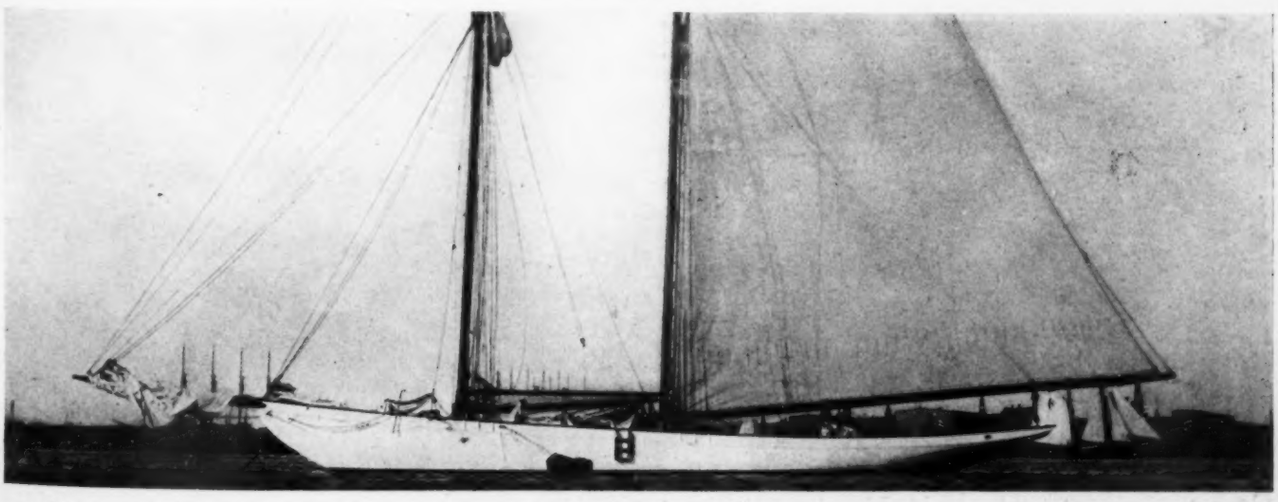

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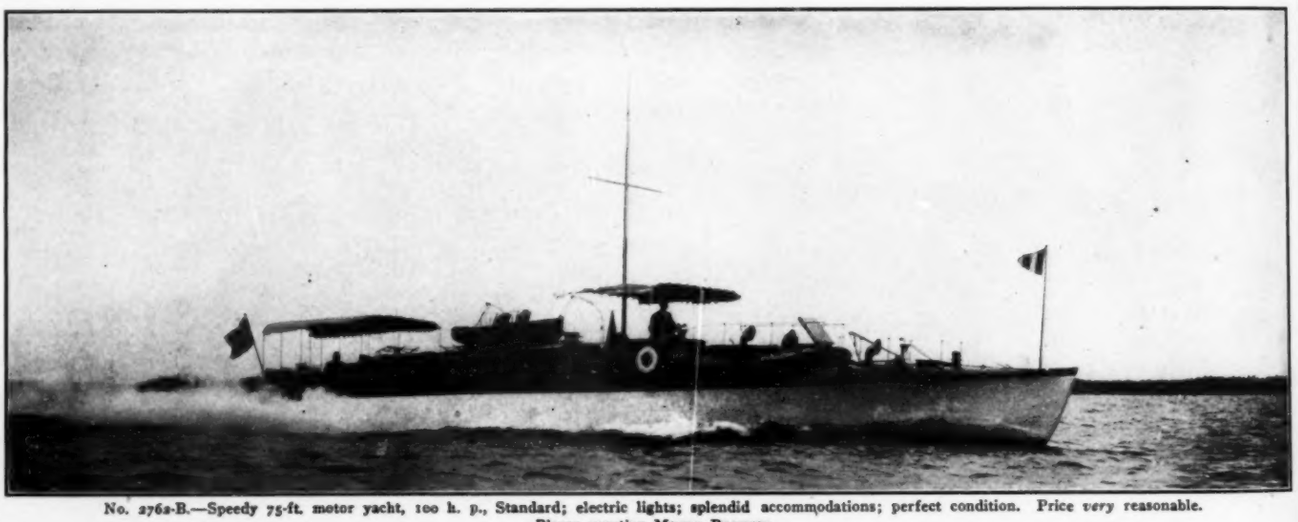

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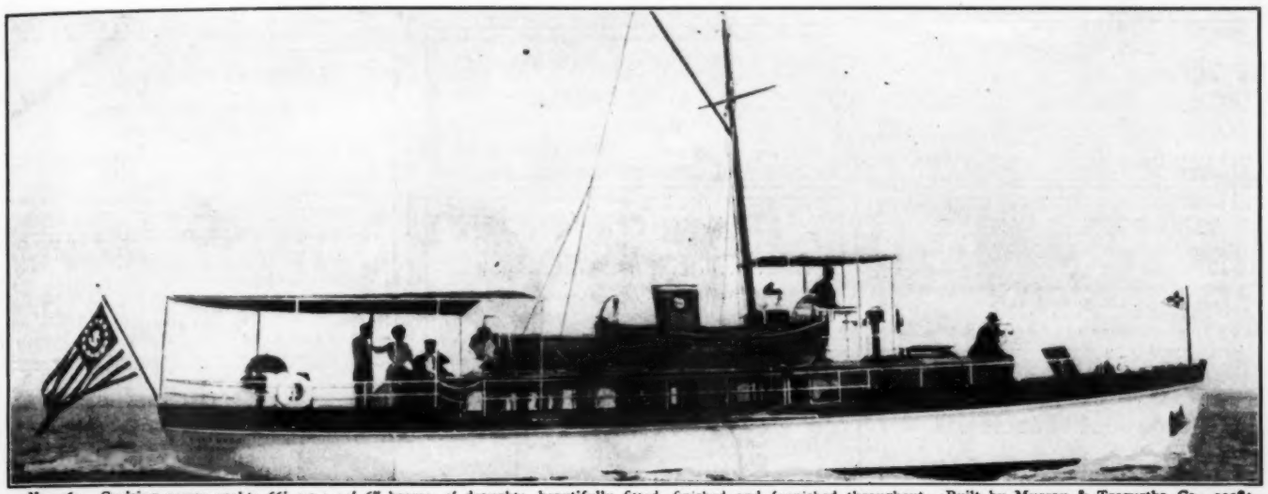

No. 567.—Cruising power yacht; 66' o.a.; 12' 6" beam; 3' draught; beautifully fitted, finished and furnished throughout. Built by Murray & Tregurtha Co., 1908; sleeps seven; 85 h.p. Murray & Tregurtha engine; speed 11 knots. All conveniences. Must be seen to be appreciated; price reasonable, in commission.

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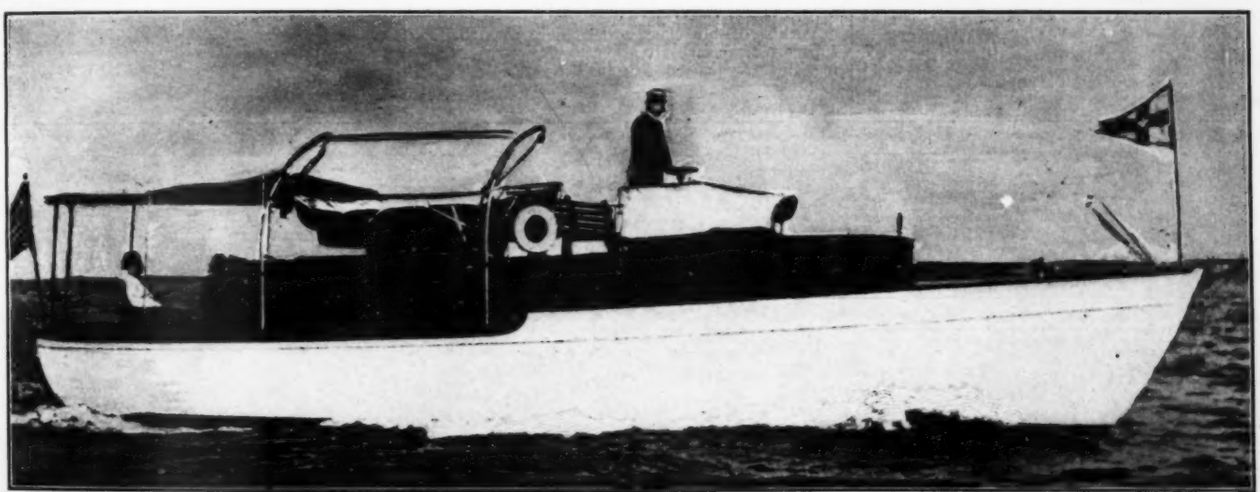

No. 501.—Cruising power launch; 45' o.a.; 10' beam; 3' draught; launched 1909; first-class construction throughout; accommodates six; 30 h.p. Murray & Tregurtha engine; speed 10 miles; price attractive.

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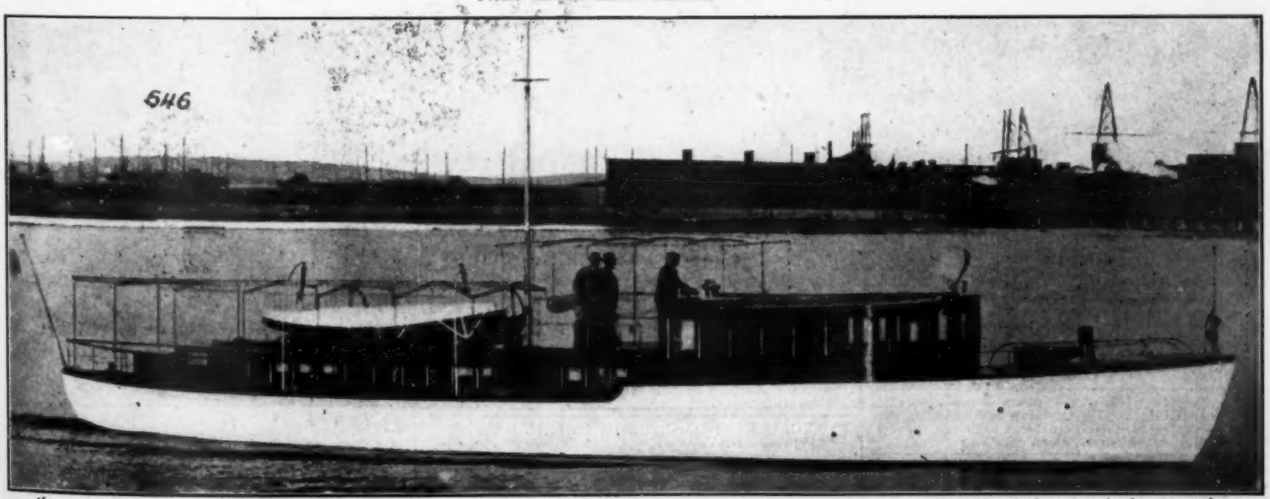

No. 546.—Twin-screw cruising yacht; 68 x 62 x 12' 6" x 4' draught; built by Murray & Tregurtha Co., 1907; sleeps ten comfortably; bathroom and other conveniences; two 60 h.p. Murray & Tregurtha engines; speed 13 miles. Price attractive.

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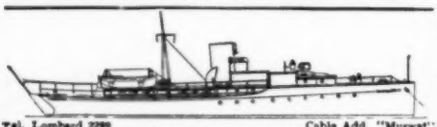

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The Simplest, Most Reliable, Most Compact
and the Smallest Perfect Marine Reverse Gear ever offered. No outside moving parts to throw the oil or grease, tear the skirts, bruise the hands or catch waste. No noise. Manufactured in sizes for from 2 to 30 H. P. We carry all sizes in stock for immediate shipment. Guaranteed for one year. Write for special prices and free catalog. Valuable information from our Consultati n Department FREE to motor boat m-n.
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Detroit Engine Works, 14 Beaufait Ave., Detroit, Mich.

THE MOTOR BOATING MARKET PLACE

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Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MOTOR BOATING.

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FOR SALE—New 30-ft. Launch and 38-ft. Auxiliary Yawl. Miller's Ship Yard, Patchogue, New York.

FOR SALE—New 33-foot open power launch; 6 cylinders, 24 H. P., 2-cycle engines; cedar siding, mahogany finish; grated floors; gather cushions. Severe Dorion, 136 So. Salina Street, Syracuse, N. Y.

FOR SALE—Well built family Motor boat; length, 26 ft.; beam, 6 ft. Draws 2 ft. 3 in. water. Six H.P. engine. Magneto, 6 Edison batteries. Summer top, awnings, cushions; complete equipment. Will sell at great reduction, as owner cannot use it this season. Arthur C. Wheeler, 13 Butler St., Norwalk, Conn.

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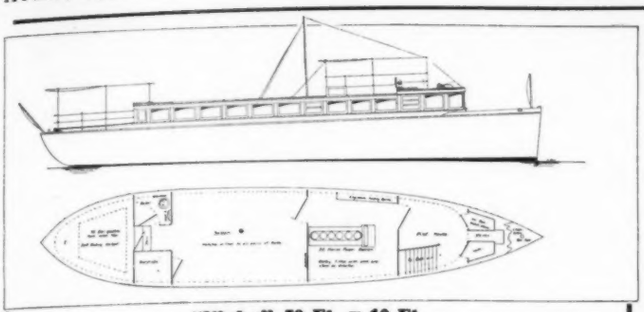
BARGAINS in Motor Boats. Write L. H. Dodge, Cape Vincent, N. Y.

FOR SALE—26x5 foot torpedo stern motor boat. 3 cyl, 15 h.p. Tuttle motor, reverse gear, speed 12 miles. Cherry decks. Fine equipment including Connecticut auto coil, awning, spray-hood, wicker chairs, etc. $500. For further particulars address, F. Elbers, 505 4th St., Brooklyn, N. Y.

WANT to buy two 14 to 18 H. P. water-cooled opposed motors. Must be in first class condition and bargains. Address, A. L. Mathwig, Sioux, Nebr.

B. B. CROWNINSHIELD, of Boston, reports the sale of 27 ft. auxiliary yawl "Mahdeena" by A. C. Needham, of Boston, to E. H. Pentecost, of England.

Motor Boating is a returns bringer—a natural result of giving motor boatists an interesting, informative, useful magazine.



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We make the only **reversible** submerged exhaust on the market and many other things you ought to know about before buying, building or repairing a boat. See our practical demonstration at the New York Motor Boat Show.

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Guaranteed not to be taken from your cylinder for the entire year

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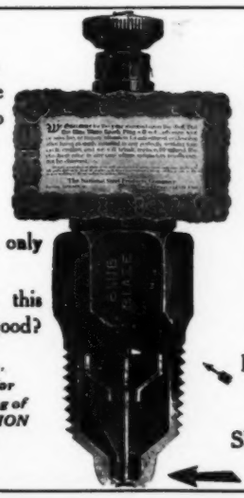
You don't have to clean this one



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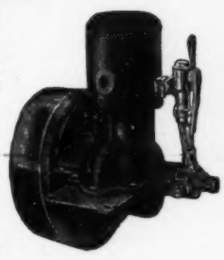

2 Actual H. P. Bare Engine $23

Complete Engine with Accessories and Fresh Water Boat Fittings, $42.00. Salt Water Boat Fittings, $4.00 extra.

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Trimount Rotary Whistle Blower $15. And Up.

An entirely new device—a Rotary Blower driven by friction with fly-wheel of the engine. **Does away with tanks. Tanks are dangerous.** This Blower throws a large body of air and with our special Bell Whistle, makes a loud, clear tone. Can be heard at a great distance, and the blast is maintained as long as driving wheel of Blower is in contact with fly-wheel of engine. No variation or falling off in tone as with compressed air system. Made in three sizes.

This outfit is very simple, nothing to get out of order. Whistle can be placed on deck wherever desired and the pull can also be located in any part of the boat. Blower is made entirely of bronze and extremely durable.

YOUR PROTECTION: Money back if not satisfactory.

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Fast, powerful, 2 H. P. reversing motor, including propeller shaft, stern bearing, stuffing box, wiring, muffler, etc., a complete equipment ready to install in your own boat for $40. An engine with a wonderful record—thousands of them in use and all giving satisfaction. Adopted by U. S. lighthouse tenders, Chicago police boat service, etc. Speedy, strong, so simple a woman can easily operate it. 2 to 10 H. P.—$40 up.

This $40 motor is a remarkable value. Send in your name for catalog today. Special prices to builders and agents.

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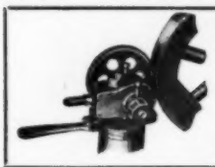
16, 18, 20, 23, 27, 28 and 35 footers at proportionate prices, including Family Launches, Speed Boats, Auto Boats and Hunting Cabin Cruisers of the latest design. Sixty-four different models in all sizes ready to ship, equipped with the simplest motors made; start without cranking; ten-year-old child can run them. Boats and engines fully guaranteed. Let us send you testimonials from some of our 12,500 satisfied owners. We are the world's largest power boat manufacturers. Our free consultation department can give you valuable, money-saving information. Write today for Free Illustrated Catalog and Demonstrating Agents' Proposition. (22)

DETROIT BOAT CO., 1147 Jefferson Ave., DETROIT, MICH.



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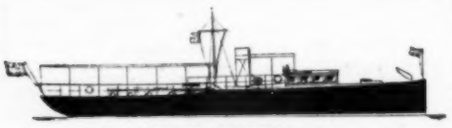

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$50 for you

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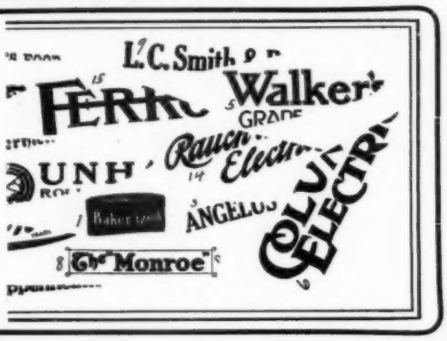
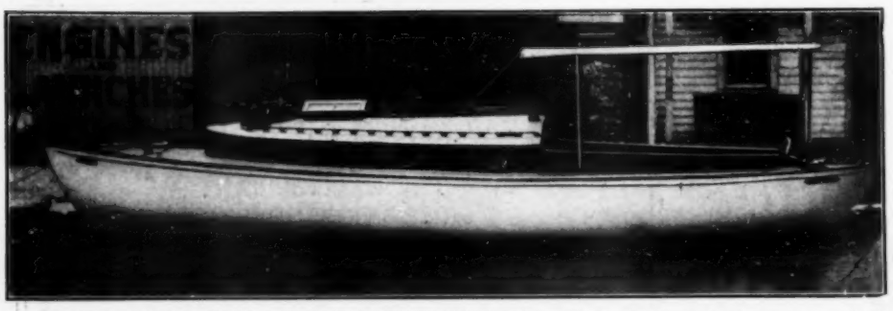


Motor Boats for Sale



TRUNK CABIN CRUISING GASOLINE LAUNCH FOR SALE—35 x 8½, drawing 3 ft., new 1908. 24 H. P. 1909 Tuttle engine; speed 10 miles or better under favorable conditions; sleeps six; toilet, stateroom, hair mattresses, cork cushions, folding anchors, cable, lights, electric lights, 3 storage batteries, dynamo, new 1908. Staunch, exceptional sea boat, alcohol stove, dishes, etc., fully equipped for cruising, cedar tender. Picture shows her stripped and just before being put in commission 1909. Added then windlass, railing, ventilators, curtains, etc. Gasoline capacity 160 gals., 100 gals. now in tanks. Ball reverse clutch. In first-class condition. Very attractive price. Address, "Owner," Box 19, Motor Boating.

FOR SALE. No. 5546. Gasoline Sea Cruiser, substantially constructed at cost of $6,000; launched 1907; 42 o.a.; 8 beam, 3 draught. Mahogany interior; 6 feet headroom. Sleeps 3. Toilet. Galley. 30 H.P. "Buffalo" engine installed 1908. Speed, 10 to 11 miles. Electric lights. Will go anywhere any time. Note unique type stern preventing squatting. Will sell less than half cost. Address Stanley M. Seaman, 220 Broadway, New York.

WILL sell or trade a 4 cylinder 4 cycle, 35 H. P. heavy-duty Marine Gasoline engine with lines, coil and pump. Guaranteed in good condition, $255.00; or will consider trade on 2 water-cooled 14 to 18 H. P. opposed engines. Address, A. L. Mathwig, Sioux, Nebr.

FOR SALE—Glass cabin cruising boat, two seasons old, accommodations for six, toilet, electric lights, dynamo and automatic cut-out and voltmeter; in fact, ready to go cruising; 24-hp. 4-cyl. 4-cycle engine. Come and see or write for particulars and price. Clarke D. Lasher, North Germantown, N. Y.

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THE ONE
Bulletin Fourteen

Treats of the K-W High Tension Magneto which is a complete Ignition System in itself. This magneto requires absolutely NO SPARK COIL and NO TIMER and NO BATTERIES of any kind, as the High Tension Current is generated in the magneto windings and carried direct to the spark plugs. The K-W High Tension magneto generates four waves per revolution of the magneto, and the heaviest engine can be started on the quarter turn, WITHOUT BATTERIES.

The K-W High Tension Magneto is designed for high speed motor boats and cars which have provision for magneto ignition and must be driven either by gear or sprocket and chain. The K-W High Tension Magneto is the only magneto made which will allow starting the engine on a quarter turn without batteries and of throttling down to from three and one-half to four miles per hour on high gear.

The K-W High Tension Magneto carries with it a Certificate of Insurance, covering it

FOREVER

against losing its power (unless battery current is run through it or the magnets are removed from the magneto, for which, of course, we are not responsible), and the size and heat of the spark never to deteriorate.

No other magneto carries such a guarantee and furthermore we agree to replace FREE OF CHARGE any part proving defective, in either material or workmanship, within two years from date of purchase.

The K-W High Tension Magneto gives a hot, fat spark on 17 R.P.M. Will positively shoot a poorer and thinner mixture than can be ignited by the most powerful battery system.

Will develop more power and greater speed than any battery system or other magneto.

K-W High Tension Magnetos will not foul sparks or allow valves to stick or pit. All wearing parts are made of crome steel, are accurately ground and lapped in place, thus insuring a maximum life. Circuit breaker and distributor can be removed and replaced at will without tools of any kind. Condenser is located right under safety gap. All windings, before assembling, are subjected to an electrical strain five times as great as they can ever be subjected to when in use, and the condenser as a whole, is tested with a high tension spark and subjected to a strain of from 20 to 30 times as great as it can be put to on the car.

Absolute freedom from breakdown on the road is guaranteed, thus entirely eliminating the necessity of the so-called "dual" ignition system. All bearings are highest grade imported ball bearings even to running parts of distributor. If this is the kind of a magneto YOU want for your high class motor boat or automobile, write us today for Bulletin 14.

THE OTHER
Bulletin Fifteen

Tells all about the K-W Low Tension Magnetos, which are used in connection with a vibrating spark coil and timer for Ignition, Electric Lights, and Combined Ignition and Electric Lights.

The K-W Low Tension Magneto acts as a powerful and reliable source of current and entirely takes the place of dry cells and storage batteries.

The K-W Low Tension magneto is designed for use on cars and motor boats which have no provision for a magneto and is driven by either belt or friction from the fly-wheel. The K-W Low Tension Magneto, when used with a K-W Coil or K-W Master Vibrator and the old coil, is absolutely guaranteed to start the heaviest engine on a quarter turn WITHOUT BATTERIES and run it perfectly at all speeds. All "L-C" models are guaranteed in addition to furnishing perfect ignition to operate powerful search lights, tail light and speedometer light, and is the

ONLY MAGNETO IN THE WORLD

which will do so.

Guaranteed FOREVER against any loss of power (unless battery current is run through it or magnets are removed from the magneto), and any part proving defective will be replaced ABSOLUTELY FREE, within a period of two years from date of purchase. This is a year longer to look for trouble than the manufacturer of any automobile or marine engine will give you on his product.

Neither the K-W High Tension Magneto or the Low Tension Magneto require any attention with the exception of a few drops of oil every few hundred miles. They are Oil Proof, Water Proof, Dust Proof, and last but not least, Trouble Proof.

SOLD ON THIRTY DAYS' TRIAL WITH MONEY-BACK UNDERSTANDING

When you go to buy a high speed motor boat or engine and the manufacturer tells you "Oh, yes, the engine has a magneto on it—the very best, etc., etc.," just turn the switch on to the magneto, give the crank a quarter turn and see IF YOU CAN START THE ENGINE. When you find you cannot start it—as you will find in every case unless it is a K-W High Tension Magneto—refuse the "Regular Equipment" magneto which only performs half what a real magneto is supposed to do and specify a K-W.

It wont cost *you* any more, although it will the manufacturer, as we do not maintain a high list and give unfair discounts to confuse. You will then be able to start, throttle down and increase the power and efficiency of your engine, WITHOUT THE ASSISTANCE OF BATTERIES OF ANY KIND.

In addition to this you are absolutely protected by the "Certificate of Insurance" for which *we* are responsible *to you* in case of any trouble or dissatisfaction.

Think these facts over. Let them sink into your very soul, and you will have no cause to upbraid yourself for the one thing, which every man hates,—being stung. **Which Shall We Send You?**

Bulletin 14—K-W HIGH TENSION MAGNETO *or* **Bulletin 15—K-W LOW TENSION MAGNETO**

Ask about the K-W Spark Coil—GUARANTEED FOREVER

THE K-W IGNITION Co
50 POWER AV CLEVELAND, OHIO. U.S.A.

Ask us for a full size copy of our Certificate of Insurance. We'll gladly send you one.

THE K-W IGNITION Co
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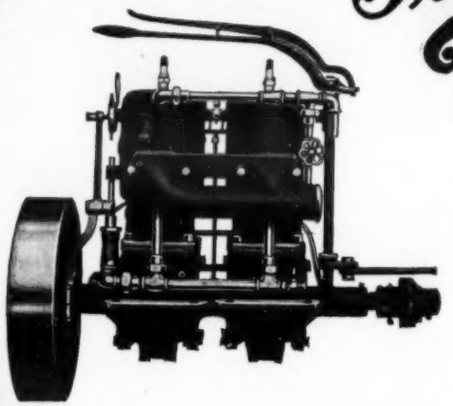
WRITE FOR NAME OF YOUR NEAREST DEALER

Tuttle



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THEY combine every well-known feature in up-to-date construction, united with the incomparable simplicity, strength, speed and endurance, which have made Tuttle Engines unique and several years in advance of all competitors.

They are Guaranteed for an Indefinite Time.

You can now purchase a Tuttle Motor for from 20 to 30 per cent less than heretofore,

because we have done away with the old-time method of selling through salesmen and have adopted an up-to-date plan of dealing direct with purchasers.

All commissions having been deducted you can now equip your boat at an extremely low cost.

Write for catalogue and full information. It will pay you.

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Metropolitan Office: City Island, New York

Boston Office: 70 Long Wharf

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Chicago, SEASON 1910.

To Everyman,

Everywhere,

Dear Sir:

We have been telling you about our new 1910 Marine Supply catalog for the past two months. We have been boasting about it some in advance, but now that we have it from the printers, we realize that we haven't boasted half enough.

We are proud of it as a reference book and as a fine job of printing. We want you to send for this catalog, and look over its five hundred pages, including HERBERT L. TOWLE on "THE MODERN MARINE GASOLINE ENGINE" and CAPTAIN A. J. KENEALY on "PRACTICAL SAILING FOR THE AMATEUR", to say nothing of GEO. B. CARPENTER & CO., on "MARINE SUPPLIES", and then let us show you how cheap and how pleasant it is to do business in CHICAGO "THE GREAT CENTRAL MARKET."

Yours very truly,

GEO. B. CARPENTER & CO.

VICE PRES.

P.S.
18c in stamps covers postage, which will be refunded on your first order.

Atwater-Kent Unisparker Type "B" with upright terminals.

Type "B" Unisparker, showing horizontal terminals.

Single cylinder Unisparker.

Standard Coil Box.

Ignition "Reliability"—

WHAT IS IT?

From the days of the old flat-spring "wipe sparker" to the present time, the ignition system has always been the weakest point of the motor boat engine. And the word "Reliability" has meant one thing as applied to the crankshaft, another as applied to the valve gear, something else when applied to the carburetor, and next to nothing when applied to the ignition.

When we say that

The Atwater Kent Unisparker
TYPE B

is **"reliable,"** we use the word in its absolute sense—not in any relative sense! A device is **reliable** when it acts **always** in the intended manner—**never** in some unintended and unexpected manner.

THE TYPE "B" UNISPARKER is a battery ignition device taking the place of the common timer and vibrator coil or the make-and-break sparker and coil. It is far more economical than either, it fires four or six cylinders in exact synchronism under all conditions, and it is **wholly free** from the delicate wearing parts and fussy adjustments of all other battery systems. Contact is made and broken mechanically—not by magnetic action—and the sparks are just as regular from a battery testing 2 amperes as from one testing 30.

Best of all—it is virtually unwearable—it will outlast most boat engines.

SEND FOR BOOKLET WITH FULL DESCRIPTION

PRICES OF THE TYPE "B" UNISPARKER

	Standard Coil Box	Kick Switch Coil Box
1-cylinder, without distributor	$18	
2-cylinder, " " (opposed)	20	
2-cylinder, with distributor	27	$30
3-cylinder, " "	30	33
4-cylinder, " "	30	33
6-cylinder, " "	32	35

ATWATER KENT MANUFACTURING WORKS

39 N. SIXTH STREET, PHILADELPHIA, PA.

ROPER Safety Propeller

PERFECT SPEED CONTROL

ABSOLUTE MASTERY OF BOAT

The Roper Safety Propeller ALONE guarantees perfect speed control to the motor boat. Among all propellers and reverse gears it is the ONLY one giving the flexibility and ease of control essential to the proper handling of the boat under all conditions. It gives the ease and facility of control of the steam driven boat to the boat using an internal combustion motor, and once the engine has been started, eliminates multi-lever control. All manouvering may be accomplished by the simple operation of one lever.

The Roper Safety Propeller obtains from the gasoline motor the same result as the throttle of the steam engine, giving the same constantly even running with the same immediate availability of the maximum power of the motor and the quick power to pick up speed. The action of the blades maintains an equal resistance on the wheel regardless of the speeds at which the boat is being driven. The engine load is practically constant and there can be no engine racing. By one easy throw of the reverse lever the boat may be sent from Full Speed Ahead to Full Speed Astern absolutely without danger to the engine. The reversing action is obtained from the blades; the work of the motor remains the same.

MEETS EVERY DEMAND OF THE MOTOR BOATMAN

Every requirement of Perfect Safety which can be satisfied by the propellor is met by the Roper Safety. It acts positively, instantaneously, without hitch, jerk or damage to boat or motor. It will bring the boat to full stop in half the distance required by other reversing devices. It will send it at Full Speed Astern in less time than it takes the boatman who uses the old three lever control to adjust spark and throttle. It will hold the boat motionless in the water against tide and wind. It will prevent drifting when it is necessary to "stand by" another boat or alongside a wharf. It gives a range of speed to meet every possible emergency.

In construction the Roper Safety Propellor is strong, serviceable, and enduring. The reversing sleeve and propeller shaft are made of Tobin Bronze. The rear bearings are babbitted. The new stuffing box is the best ever made for use on a motor boat. The construction of the blades, the removable hub and the spider which moves the blades to positions of varying pitch is such that the Roper Safety Propeller is dependable, enduring and always efficient.

BOW CONTROL. For use on motor boats where control is desired from some position other than directly back of the motor, the Roper Safety Propeller Bow Control is the only satisfactory control offered. It gives all the ease of control of the regular equipment and acts in a manner exactly similar to it. The Bow Control Equipment gives absolute control from any desired point in the boat, alongside, back or forward of the motor.

The Roper Safety Propeller is the ONLY propeller which in any appreciable manner does away with the old, confusing, three lever, engine racing, stalling, inefficient, unsafe and positively dangerous method of motor boat control.

Every Motor Boatman should at least know what the Roper Safety Propeller is and what it does. Write for details.

AGENTS IN UNITED STATES

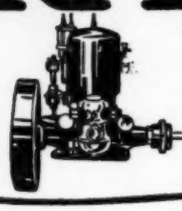
New York City—Henry C. Squires' Sons, 44 Cortlandt St.
Boston, Mass.—Kershaw-Williams Co., 27 Haverhill St.
Philadelphia, Pa.—W. S. Carman, The Bourse.
Portland, Me.—G. D. Thorndike, 29 Portland Pier.
Chicago, Ill.—James M. Wait & Co., 1205 Michigan Ave.
Jacksonville, Fla.—Geo. E. Chase & Co., 232 E. Bay St.
Portland, Ore.—Rierson Machinery Co.
Providence, R. I.—Walter Coleman & Sons, 308 S. Water St.
Seattle, Wash.—Palmer Bros., 800 First Ave., South.

AGENTS IN CANADA

Mortreal—Henry Morgan & Co., Ltd., Colonial House.
Brantford—Schultz Bros. Co., Ltd.

C. F. ROPER & CO. ***Hopedale, Mass.***

GRAY MOTORS



For Boats

The Power of Gray Motors

The fact that GRAY motors won more races all over the United States last year than any other one make of engine is not a mere happenstance. It is because GRAY motors deliver the power, and when you buy a marine motor it is **power** you buy and pay for, whether it is delivered to you or not.

GRAY MOTORS deliver more power for the price you pay than any other marine engine built in the world, and with a GRAY motor you get the highest quality of workmanship and material that it is possible to put into a marine engine.

Delivery

Don't be disappointed in your marine engine for 1910.

Get your order in early and placed with some firm who can make reasonably prompt and sure delivery.

The congested condition of the material market, the tremendous drain on the drop forging and material supply concerns of the world, caused by the automobile industry, will make deliveries of marine motors this year more uncertain than they have ever been before.

The automobile manufacturer with large margin of profit can afford to pay bigger prices, and in fact will pay almost any price to get materials.

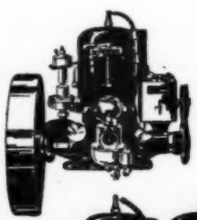
The GRAY Motor Company has foreseen this condition and has been getting ready for it for the past seven months, beginning to manufacture 1910 engines in September of 1909, and buying material prior to that date.

We increased our capital $150,000 to enable us to go into the market and buy materials in advance and machine up this material ahead of time.

Gray Motors are built in the largest and most up-to-date plant in the world devoted exclusively to 2-cycle marine motors.

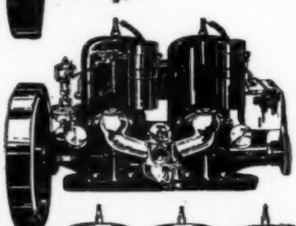
You are safe when you buy a GRAY Motor, you will get big power, you will get prompt delivery, you will get a modern motor, you will have the plant behind it, and you will get a guarantee that is absolute.

Write us and let us show you what our organization consists of; what our experience consists of; why we can give you prompt and positive delivery and why we can give you the highest quality which it is possible for mechanical skill to produce.



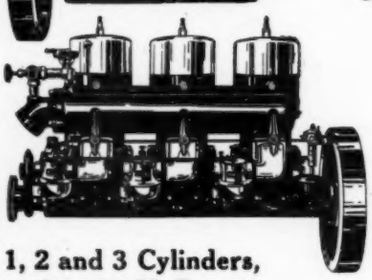
6 H. P.—power, workmanship and material absolutely guaranteed by a responsible concern. Ready to install in your boat COMPLETE.

$94 to $118
depending upon outfit.



12 H. P.—Guaranteed to develop 14 to 16 H. P. Complete outfit, ready to install in your boat.

$198 to $237
depending upon outfit.



21 and 36 H. P. Model T

Write for Special Literature.

1, 2 and 3 Cylinders, 3 to 36 H. P.

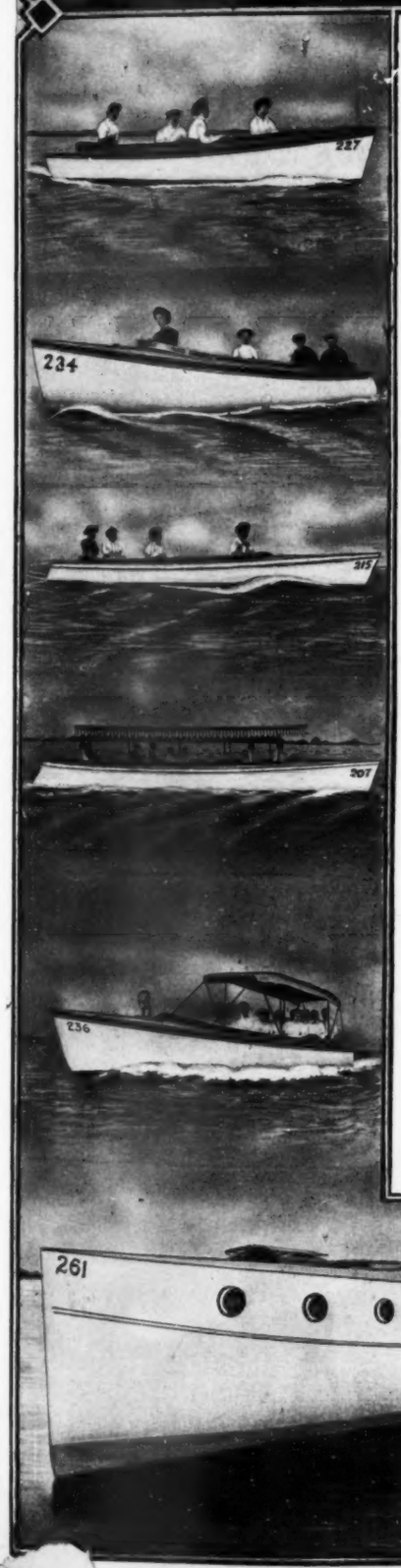
Write for big Catalog to-day—most complete marine gas engine catalog published.

Gray Motor Co., 931 Leib St., Detroit, Mich.

SHIPPED KNOCK DOWN **BROOKS** EASILY PUT TOGETHER

BOATS

GUARANTEED TO BE SATISFACTORY



YOU WANT A BOAT

Build It Yourself and Save Two-Thirds

We will furnish you with all the parts of a boat machined, cut to shape, and accurately fitted together prior to shipment, so that with a little labor on your part, you can own your own boat, at a price that is ridiculously low, or we will furnish you with instructions and full size paper patterns, from which you can build the boat yourself, by purchasing the material locally.

You want to know how it can be done? Then send to-day—not to-morrow—for

OUR NEW CATALOG NO. 24—IT'S FREE

The exceedingly low prices will amaze you

For the year 1910 we have made the enormous cut of 33⅓ per cent. from our regular prices—just one-third less than they were last year.

Do you know that local boat-builders all over the country purchase our frames—build the boats and sell them at a handsome profit? You can do this yourself and save that profit. Anyone can put our Knock-Down boats together—no skill is required. The work is a clean, instructive form of recreation—a mighty good thing for you or your boy.

We save you (1) the boat-builder's profit; (2) labor expense; (3) big selling expense; (4) seven-eighths the freight.

Don't fail to send for Catalog No. 24—it tells the whole story

OUR GUARANTEE

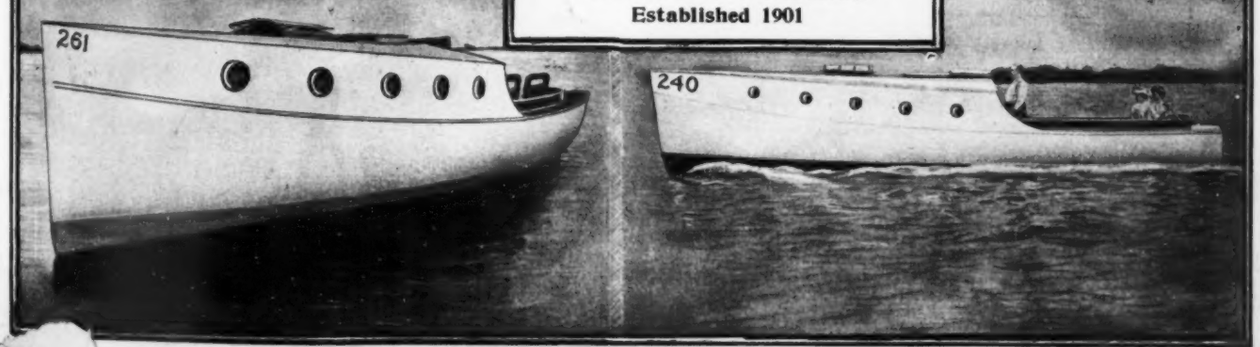
is that you will be perfectly satisfied with everything you purchase of us. or your money will be instantly refunded.

BROOKS MANUFACTURING CO.

503 Ship Street, SAGINAW, MICH., U. S. A.

Originators of the Pattern and Knock-Down System of Boat-Building.

Established 1901



MULLINS STEEL BOATS

CAN'T SINK

SAFE, FAST AND DURABLE

Mullins Boats are built of smooth steel, puncture-proof plates, with air chambers like a life boat. They glide through the water easily. Cannot sink, crack, warp, open at the seams, dry out or wear out. Require no calking. Above illustration shows our 26-foot, 40 h. p. launch, with auto seats and control, in Government service. Speed, 17 to 19 miles. Price, with cushions, $1250.

MULLINS $110 LAUNCH

the lowest priced, **good** launch built. Our most famous model. Thousands in use. Engine, hull and fittings same quality as our larger boats. Sold under same guaranty. A staunch, noiseless, speedy, reliable launch at the lowest price ever quoted.

Greatest Values Ever Offered

Six other models, 16 to 24 feet. 3 to 20 h. p. All have 2-cycle engines that **can't backfire**, silent underwater exhaust, one-man control, inside stuffing box, outside gasoline intake, improved carburetor and reversing device, and many other exclusive features.

CATALOG FREE! Big 1910 Catalog describes all launches, also full line of Row Boats, Hunting and Fishing Boats, Marine Engines and Accessories. Write for it.

THE W. H. MULLINS CO., 182 Franklin St., Salem, Ohio

LARGEST BOAT BUILDERS IN THE WORLD

Ask The Man Who Owns One

"MASCOT"
Owned by E. Corsepius, Fort Madison, Iowa, equipped with 6 Cylinder Pierce-Budd Co. engine—speed much over 30 miles per hour.

These are some of the owners—E. Corsepius, Fort Madison, Iowa, Fred B. Smith, Terre Haute, Ind.; Capt. Wm. Rattray, Marine City, Mich.; A. Arnold, Jr., Bay City, Mich.; Minn. Boat and Power Co., Stillwater, Minn.; Dr. O. B. Monosmith, Lorain, O.; S. P. Pankost, Sacramento, Cal., and many others.

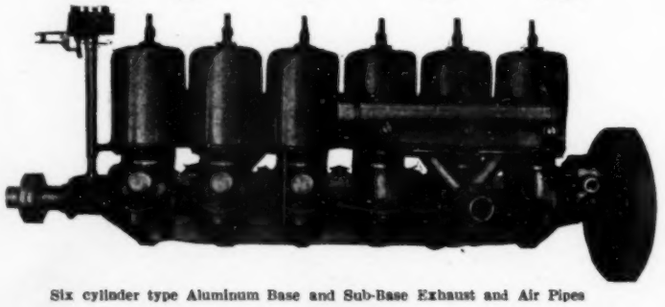
The following boats all over 30 miles per hour are equipped with our 6 cylinder Engines; "Mascot," "Coyote," "102," "Teddy II," "Evangeline," and another just finished before close of navigation which made 33 miles per hour.

1910 TYPES

	4 to 6 H. P 1	12 to 15 H. P. 2	18 to 25 H. P. 3	40 to 60 H. P. 6 Cylinders
Weights	116 lbs	170 lbs	217 lbs	390 lbs
Price	$155	$295	$450	$1072

Strong—Simple—Durable. Made from best material attainable—by motor experts.

Best equipped Engine in the world. Send for new 1910 catalog.



Six cylinder type Aluminum Base and Sub-Base Exhaust and Air Pipes

PIERCE-BUDD CO., Marine Motor Manufacturers

205-219 Saginaw Street, Bay City, Mich.

HARRIMAN MOTOR WORKS INC.

MANUFACTURERS' ANNOUNCEMENT

We have in stock 100 MEDIUM DUTY MARINE ENGINES, built for the firm of BREED & DE BLOIS (dissolved), formerly of 1876 Broadway, New York. The failure of BREED & DE BLOIS gives the engine buyer the CHANCE OF HIS LIFE, as we will retail these engines at CONTRACT PRICE, direct to the customer. An engine of higher quality cannot be built, and these engines carry our absolute guarantee of quality, workmanship and performance. The Harriman Motor Works will carry a complete line of parts for the engines and will continue the production of this type of engine. Power: 10 H. P. to 30 H. P.

HF High Speed marine engines built by this company will give you more speed for your hydroplane or racing boat, as they are more powerful for their weight than any engine on the market. Power: 10 H. P. to 100 H. P.

Write us for prices and particulars

HARRIMAN MOTOR WORKS INCORPORATED

GLASTONBURY CONN.

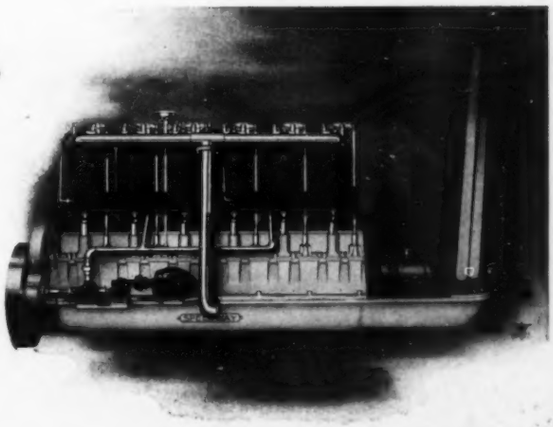
MOTOR BOATING

"SPEEDWAY"

means marine gasoline engine efficiency. A strictly high-class up-to-date all around motor for cruising, speed or commercial boats, four cycle type, 8 to 150 H. P. in stock. Hundreds of them in successful operation in all parts of the world.

GAS ENGINE & POWER CO.
AND
CHARLES L. SEABURY & CO.
CONSOLIDATED
Morris Heights, New York City, New York

Designers and Constructors of High Class Craft of All Sizes and Styles for Pleasure or Commercial Service.



"Seabury" Water Tube Boiler and Marine Engines

THE ONLY NAPHTHA LAUNCH

Send 10 Cents for New Catalogue

PYRAMID ALUMINUM

The Ideal Floor Cover for Motor Boats

or any purpose requiring a clean, durable, sanitary floor, will not tarnish, discolor or corrode and is practically indestructible and ever-lasting. Write today for descriptive circular and prices.

FACTORY SALES CORPORATION

1434 MICHIGAN AVENUE : : : : : : : : : CHICAGO, ILL.

EXTRA SCRIPPS BULLETIN
The Pastime, a 42-foot cabin cruiser, 10 ft. beam, 11 tons register, is owned by M. J. Naylor, Orange, Texas. This boat is built primarily for comfort, and is by no means light, yet with its 4-cylinder 25-30 H.P. Scripps Motor, it makes a speed of 12 miles an hour. Considering the weight and size of the boat, this is really a remarkable record for the engine.

SCRIPPS MARINE MOTORS

Different boat owners "swear by" Scripps Motors for different reasons

Some have made remarkable racing records with a Scripps; others have put this staunch engine through gruelling tests that have thrown its reliability and sturdiness into strong relief; still others tell us enthusiastically of its great reserve power, which is much in excess of its regular catalog rating.

Our "Bulletin" this month tells of the successful record of a Scripps motor in a heavy boat built only for comfort. Yet with a four cylinder, 25 to 30 H.P. Scripps motor, the owner enjoys both speed, power and comfort.

The first and foremost idea in the factory that builds Scripps motors is to hold the quality of both material and workmanship up to the high standard found in the highest type of automobile engines. All Scripps motors are four cycle in type, and are made with from one to six cylinders, four to one-hundred horse-power.

Our catalog in your hands will be a great help to you in equipping your boat for the coming season. Write for a copy to-day.

Scripps Motor Co.

651 Lincoln Ave., Detroit, Mich.

Prest-O-Carbon Remover

When Overhauling Your Engine Try This!

The difference between a poor engine and a quiet, smooth-running, powerful engine is frequently nothing but carbon deposits.

It used to be thought necessary to tear the engine to pieces and scrape out the carbon—a slow, hard job, and the ruination of thousands of good engines.

Prest-O-Carbon Remover does the job with ease, promptness and safety, and at trifling expense.

For Auto, Marine and Stationary Engines.

We Positively Guarantee that Presto-O-Carbon Remover, injected in the cylinders **according to directions,** will loosen and remove every particle of carbon from cylinders, pistons, piston rings, and valves, and increase the compression, power and durability of your engine, without injuring the metal in any way.

All you do is to remove a spark plug, apply Prest-O-Carbon Remover with an oil gun, and let it stand in each cylinder for an hour. The same liquid can be used several times.

We Will Refund Your Money

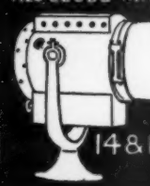
If Prest-O-Carbon Remover doesn't do all we claim for it. Price: Gallon, $3.75; Half Gallon, $2; Quart, $1. Beware of imitations containing kerosene or strong acids. If your dealer does not supply you promptly, send your order to us, to be shipped from our nearest office.

The Presto-O-Lite Co.
Makers of Prest-O-Lite Gas Tanks

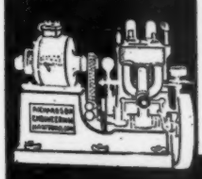
260 E. South St., Indianapolis, Ind.
Branches at New York, Boston, Philadelphia, Cleveland, Chicago, Detroit, Providence, Minneapolis, Omaha, Dallas, Los Angeles and San Francisco.

ALL GOODS MADE IN OUR OWN FACTORY

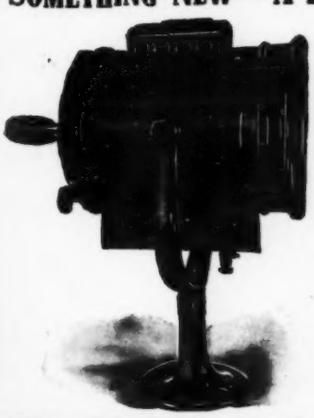
OUR SPECIALTY
COMPLETE ELECTRIC LIGHT OUTFITS
SEARCHLIGHTS ETC.
THE RICHARDSON ENGINEERING CO. HARTFORD, CONN.


14 & 18 IN. PROJECTORS

MARINE ELECTRIC LIGHT OUTFITS $150 UP
STATIONARY ELECTRIC LIGHT OUTFITS $262 UP



SOMETHING NEW—A REAL ARC SEARCHLIGHT 6 in. diameter For $70. Ask for discount



It will throw a piercing, bright, white light 1-4 mile. Not a toy. Built like our larger ones with automatic shunt feed and automatic focusing. Requires but a small dynamo to run it.

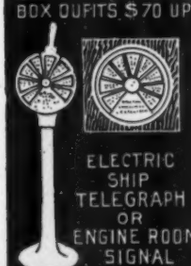
THIS IS THE LATEST AND BEST ON THE MARKET

We have a new catalogue No. 38, ask for it

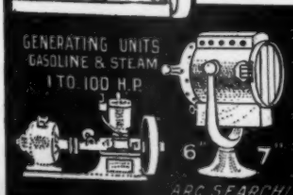
If you are interested in any of our goods ask for literature on special ones you want, as we have 8 publications.

The Richardson Engineering Co., Hartford, Conn.

AUTOMATIC STORAGE BATTERY CHARGING BOX OUFITS $70 UP


ELECTRIC SHIP TELEGRAPH OR ENGINE ROOM SIGNAL

COMPACT DOME OR CEILING LAMPS


GENERATING UNITS GASOLINE & STEAM 1 TO 100 H.P.
6" 7" ARC SEARCHLIGHT

9" PILOT HOUSE CONTROL SEARCHLIGHT

SPECIAL MARINE STORAGE BATTERIES

COMPACT YACHT FIXTURES

AUTOMATIC STORAGE BATTERY CHARGING SWITCHES

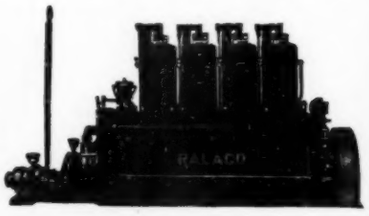
For the REAL Motor Boatmen

Only one motor boatman in every 200 can have a Ralaco Engine. Yet the output is constantly taken by boat owners and buyers who want a motor that will respond to any demand — whether merely a day's outing or a cruise to Bermuda and back.

RALACO
THE SILENT SIMPLIFIED ENGINE

took the big cruiser Nomad II, Toledo to New York and back, without being touched by a tool. It is a Ralaco that ran 6½ days — 156 hours — without a hitch, skip or stop; 1,442 miles without a spare part on board, and with no attention except oil and fuel.

Send for the RALACO book It tells you all about these famous 4-cycle engines — 10 to 50 h. p. — $400 to $3,000



The **S. M. JONES COMPANY**

Segur Avenue
TOLEDO, O.

(2)

136 Liberty Street
NEW YORK

STORES and OFFICES TO LET

IN THE

New York American Building

HUB OF THE AUTOMOBILE SECTION

Broadway, Columbus Circle, Eighth Avenue and 58th Street

Most Prominent Location in New York

Automobile Dealers, Stock Brokers, Commercial Schools, Advertising Agents, Artists' Studios, Dentists and Theatrical Agencies will find that this Building, its equipment and situation, offer the best place to locate.

Unlimited Opportunities for Sign Privileges and Advertising Purposes

Apply on premises or to

Huberth & Gabel, Agents, 147 Fourth Avenue Telephone 1390 Stuyvesant

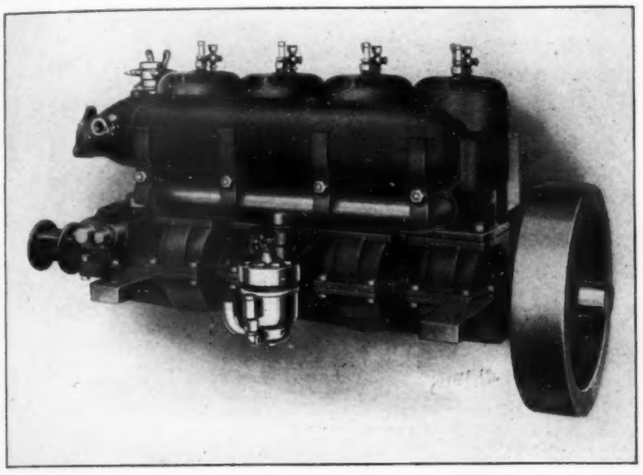
OR YOUR OWN BROKER.

Sub. Sta. (Columbus Circle), "L" Sta. (9th Ave.—59th St.), B'way, 7th Ave., 8th Ave. surface cars, 59th St., 42d St., 34th St. crosstown cars, 5th Ave. and Riverside stages pass the door.

Roberts Motors Win Again

After the most thorough tests by expert mechanical engineers, the W. H. Mullins Co. (The World's Largest Boat Builders), recently placed an order for 2,000 specially designed Roberts Motors. This is the largest order ever placed for marine engines and is convincing evidence of the superiority of Roberts Motors.

ROBERTS 1910 MODELS ARE THE PERFECTION OF SIMPLICITY



The large ports, which have proved such a success on 1909 Model P will be used on all 1910 models—the new noiseless carbureter, with but one adjustment (the gasoline) is a great improvement. Gear-driven mechanical oilers will be supplied with all motors from 10 H. P. up, also gear pump—readily accessible and easy to remove for packing or cleaning without disturbing the piping.

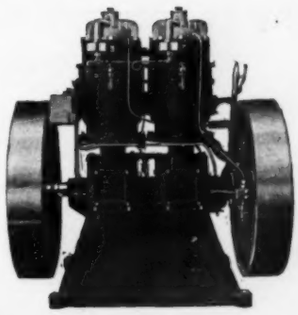
The Roberts is the only two-cycle engine made that is absolutely guaranteed against backfiring or base explosions. It is the lightest and most efficient engine built. Every part is so accurately adjusted that it starts on the first turn of the crank, and will not stall at any speed. The Roberts gives greater power and more speed than any other motor of the same H. P. made.

WRITE TO-DAY FOR BOOK OF TESTIMONIALS AND CATALOG which fully describes our 11 unequalled models, from 1½ to 60 H. P. and their many new improvements.

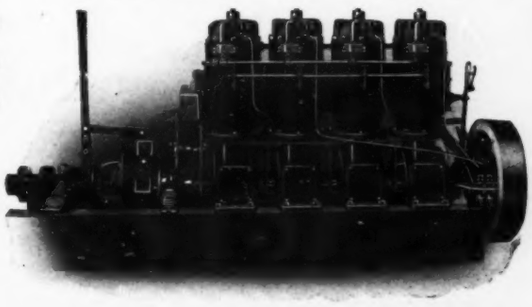
THE ROBERTS MOTOR COMPANY
1501 Columbus Ave., SANDUSKY, O., U. S. A.

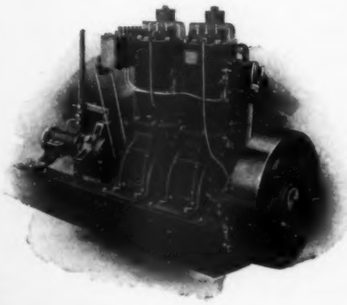
THE REMINGTON OIL ENGINE

NO VALVES GEARS ELECTRICITY CARBURETOR **IT IS** RELIABLE ECONOMICAL SIMPLE ACCESSIBLE



NOT a gasoline engine with oil attachment. You have heard some people knock the "Oil Engine?" Write us about it, all "Oil Engines" are not alike. As an instance, we have sold one consumer (not a dealer) over $12,000.00 worth of engines on repeat orders.





These engines are built for *business* not for *play*. They go into plants and boats that *must go*.

SEND FOR CATALOGUE M

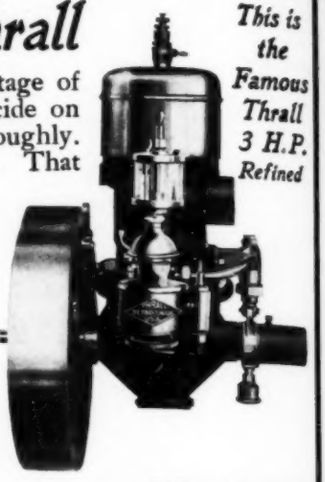
Middle West Representative - - - Remington Engineering Company
1018 North Sixth Street, St. Louis, Mo.

The Remington Oil Engine Co., Stamford, Conn., U.S.A.

Investigate All—You'll Decide on a Thrall

Get all the facts about all motors. Take note of every feature, every advantage of each. Think what those features and those advantages mean to you. Then decide on the one that is best. You will get the right motor if you investigate thoroughly.

The more you know about motors, the better you will like a Thrall Refined. That is why we invite close comparison. For then you will know the Thrall advantages in speed, simplicity, economy, durability and strength over *all* motors.

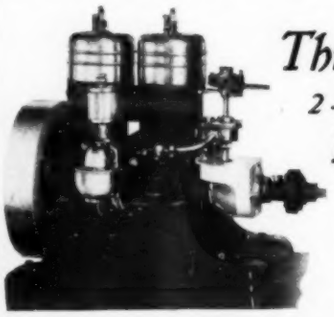


This is the Famous Thrall 3 H.P. Refined

Mail The Coupon For The Best Book on Motors

Although Thrall owners have the fastest boats, speed isn't the sole reason for buying a Thrall. Let us tell you all the reasons. It's worth your while to investigate. Read its record. "The Limit," the fastest boat of its size and power in the world, is equipped with a Thrall. So is "Bub," the boat that went 310 miles in 25 hrs., 10 min. Thralls are made in sizes from 3 to 12 H. P. The 3 H.P. Thrall weighs only 60 lbs. Its record proves that excessive weight is unnecessary for speed, power, endurance or durability. The facts are interesting. Our book will tell you about the motor that will ensure the most motoring pleasure. Mail the coupon now.

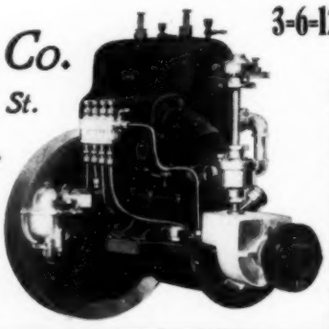
Mail To Us Now



Thrall Motor Co.

2-38 Twenty-first St.

Detroit, Mich.



3-6-12 Horsepower

FREE BOOK COUPON

THRALL MOTOR CO.,
2-38 Twenty-first Street, Detroit, Mich.

Gentlemen:—Please send me your beautiful new catalog and full information on Thrall Refined Motors, 3, 6 and 12 horsepower.

Name .....

Address .....

.....

THE "KENNEBEC"

Sturdy Enough for the Fisherman

The fisherman, who goes out in any and all kinds of weather, day and night,—winter and summer,—puts his engine to the severest test possible.

His very livelihood depends upon the reliability of his motor, and he MUST have an engine upon which he can depend at all times and seasons, and under all conditions.

Do you want a better recommendation than this for the engine for your Motor Boat?

Handsome Enough for the Finest Pleasure Boat

Remember, Mr. Boat-Owner, that while you do want an engine upon which you can depend, and which will stand up under all possible hard knocks, you do not want a rough looking, uncouth mass of metal to put in that handsome new boat of yours, and just because the KENNEBEC stands hard usage and exacting conditions, do not fancy it is a "rough jewel." It runs more smoothly and is the most completely equipped motor that you have ever seen, splendidly finished and in any size exceeds its rated horse-power from thirty to forty per cent.

Ask the Fishermen what they think of the "KENNEBEC" ENGINE

Write for Catalog M

Manufactured by TORREY ROLLER BUSHING WORKS, BATH, MAINE

NEW YORK AGENTS:

THOS. I. SIMPSON & CO., 68 South St.

Baldridge
Reverse Gear

ANY experienced motor boat owner will tell you the only way in which you can have perfect and confident control of your boat is to install a reliable reversing device.

Stands to reason you would be safer in a boat that you can control simply by moving a single lever---all you have to do with the reliable "Baldridge".

The "Baldridge" is in use in nearly 5000 boats of every size and kind, and not a single gear has failed to make good. This is part proof of our claim that the "Baldridge" is the most reliable gear you can buy anywhere at any price. It is one reason why every "Baldridge" user is a "Baldridge" booster.

Our booklet goes into details---tells just how the remarkable "Baldridge" reliability is made possible. Tell us where to send you a copy.

SMITH & BALDRIDGE MACHINE CO.
63 AMSTERDAM STREET
Detroit, Michigan

"The gear to bear the wear and tear"

VARNISH ADVICE

Ninety-nine times out of a hundred you can, without hesitation, say that the varnish that will give you the greatest satisfaction and require no explanations, no excuses, is

Edward Smith & Co.'s Spar Coating

It is pale, hardens quickly, and by the test of time is recognized the most durable of marine finishes.

For the exceptional cases, for example, for work which is awash most of the time and where it is a question of withstanding water rather than weather, or for a quick job when cruising, use our

Quick Marine Coating

It dries "extra quick" and does not turn white under water.

Free on Request

Winners---Being a record of the names of the winning yachts and owners of the racing season of 1909. A postal card addressed to Edward Smith & Co., P. O. Box 1780, New York City, will bring it to you.

EDWARD SMITH & CO.

Varnish Makers for 83 Years

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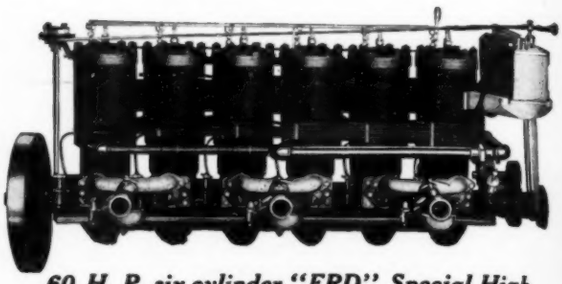
PRESERVATIVE COATINGS
E S 1827 & Co.
TRADE MARK.

"ERD" 1910 MARINE MOTORS

Embody the most improved design and the highest quality in Marine Motors known to the Motor Boat world.

ERD MOTORS have won their great reputation through the perfect service they have given in the hands of inexperienced operators.

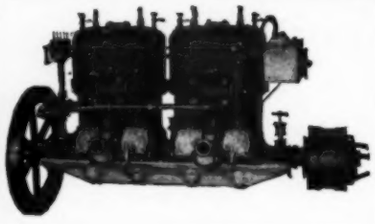
Let us figure with you on the power equipment for your boat. We can save you money. Write today for our illustrated catalog No. 47.



60 H. P. six cylinder "ERD" Special High Speed Type

ERD MOTOR COMPANY

SAGINAW, MICH. U. S. A.



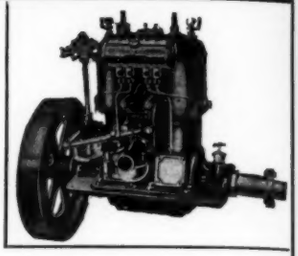
32-40 H. P. FOUR CYLINDER TWO CYCLE, 456 LBS. $500

Atwater-Kent Ignition, Mechanical Force-Feed Oiler, Aluminum Composition Bed and Hand-hole Plates,

Water-Cooled Exhaust and Salt Water Fittings

16-20 H. P. TWO CYLINDER TWO CYCLE, 337 LBS. $250

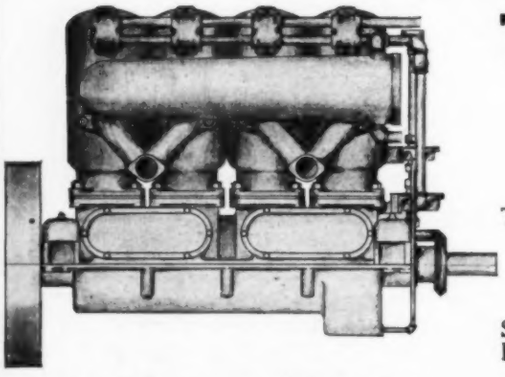
Salt Water Fittings Throughout



60 H. P. 6 CYLINDER TWO CYCLE 300lb RACER, $2000

Vanadium and Krupp Steel Working Parts. Copper Water Jacket

THE EMERSON ENGINE COMPANY - - - ALEXANDRIA, VA.



It will pay you to see the Dodge Engine before buying.

The Dodge Engine

has no equal for

Durability, Economy, and Simplicity

1, 2, 3, 4, and 6 cylinders

Two Cycle, Open Crank Case, from 4 to 60 H.P.

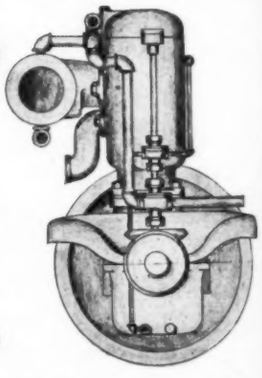
SATISFACTION GUARANTEED

Catalogue and price list free for the asking

Special inducements with the first fifty engines sold beginning February 1st for spring delivery.

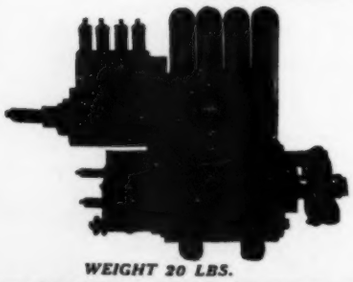
DODGE ENGINE CO.

384 ATLANTIC AVENUE, BOSTON, MASS.



Grand opportunity for a few hustling agents.

NEW HEINZE MAGNETO



WEIGHT 20 LBS.

will generate a large spark firing charges positively when cranked or running at a low speed.

At 50 R. P. M. will produce a 3/8" spark.

At 1,000 R. P. M. the primary voltage is 6.8.

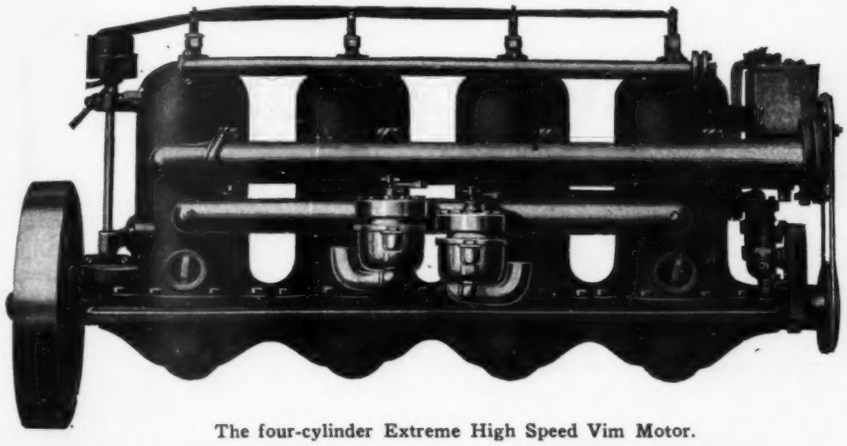
Its short circuit currents amount to 5.7 amperes.

All parts are waterproof.

Let us send you Catalog 8, giving full information.

HEINZE ELECTRIC COMPANY LOWELL, MASSACHUSETTS

To the man who owns or plans to own a speed boat:



The four-cylinder Extreme High Speed Vim Motor.

Bore and Stroke 5x5 inches
3 cylinder—35-40 H.P.
4 cylinder—40-55 H.P.

Bore and Stroke 4x4 inches
2 cylinder—12-15 H.P.
3 cylinder—19-23 H.P.
4 cylinder—26-31 H.P.

In our announcements of the past few months we have said the new Extreme High Speed Vim Motor is the most perfect two-cycle engine built; and that it develops more power and higher speed than any other engine in the world of like dimensions.

We have stated nothing more than simple facts.

They would be sensational, no matter how stated—but they are facts.

This new type of the Vim is as simple and uncomplicated in design as the Vim line has always been; as rugged and staunch in construction; and maintains the perfect Vim balance and proportion between power and weight.

It is, in short, an engine with which you should thoroughly familiarize yourself before you buy a motor for the coming season's boating.

THE NEW EXTREME HIGH SPEED

VIM MOTOR

The Most Perfect Two-Cycle Motor Made

It is a fact that the ordinary two-cycle engine delivers its maximum power at 750 to 800 revolutions per minute. Above that engine speed power falls off because the speed is too great to permit sufficient gas to be drawn through the intake port.

Hence the two-cycle has heretofore been considered unsuitable for the very high speed work.

The manner in which we have eliminated this problem in the new Extreme High Speed Vim represents the greatest advance ever made in two-cycle construction.

This motor is provided with a double set of carburetors; a double fuel pipe and a secondary port.

So that, at engine speeds up to 1300 to 1400 revolutions per minute, the crank case fills with fuel mixture, ample in quantity to produce two-thirds more power than by the single carburetor and intake pipe method.

Repeated tests by disinterested parties showed that at an average of 1268 revolutions per minute the actual horsepower developed with a two-cylinder (4"x4") Extreme High Speed Vim was 16.4—whereas the best an ordinary two-cycle could do was 10 horsepower.

This feature is peculiar and exclusive to the Extreme High Speed Vim.

It is the ideal solution of a problem which has long baffled gas engineers; for it adds neither weight nor complication to the utterly and beautifully simple Vim.

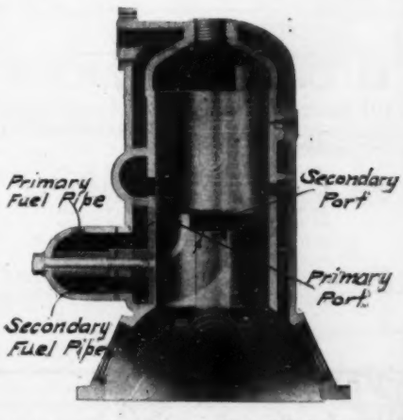
It can be readily seen that this new Vim's development of power is really greater, and the speed consequently higher.

No other engine presents so many superiorities, aside from power and speed, as this.

WHY AND HOW THIS VIM DEVELOPS ITS EXTRAORDINARY POWER AND SPEED

The phantom sectional view herewith shows the cylinder construction of the Extreme High Speed Vim Motor. It will be seen that the piston is at the top of the stroke, in which position the ports are uncovered, and it is at this moment that the charge of fuel enters the crank case, being drawn in by the vacuum created by the upward travel of the piston.

It will be seen that the port or opening at the left is smaller than the port at the right. The port at the left is of the size found to be best in gas engine practice and gives as much power as any regular two-cycle motor, but it is when the port at the right is used in connection with its separate opening and carburetor that a greater quantity of fuel mixture is drawn into the crank case at high engine speed, actually producing two-thirds more power than any other engine of like dimensions—two or four-cycle—can develop.



THE VIM MOTOR MANUFACTURING CO.

440 Market Street, Sandusky, Ohio

Representatives:

Southwestern New York, Connecticut and Northwestern New Jersey,
OTTO GAS ENGINE WORKS
136-138 Liberty St., New York.

Portland, Me.,
G. D. THORNDYKE MACHINE CO.

Central New York,
W. D. DUNNING, Syracuse.

Baltimore, Md.,
F. B. BURTON.

Northwestern Washington,
MARINE CONSTRUCTION CO., Tacoma.

Philadelphia, Pa.,
W. S. CARMAN, Bourse Bldg.

Montreal, Ont.,
I. L. LAFLEUR, Ltd.

It is neither underweight, nor overweight; but proportioned so nicely to its power development that it will stand up under three to six times the hard work that can safely be imposed upon any other speed engine.

Before you fit out your boat for the season; or before you buy a new motor—get all the information you can about this splendid, sturdy, Extreme High Speed Vim.

Simply clip the coupon, fill the blanks, and mail it.

THE VIM MOTOR MFG. CO.,
440 Market St.,
Sandusky, Ohio.

Please forward at once the Vim catalog, and literature pertaining particularly to the Extreme High Speed Vim.

Name.....

Address.....

THE GURNET DORY

TRADE MARK

AND THE **SEMI-SPEED CLIPPER LAUNCH** ARE

SEA-GOING MOTOR BOATS

WITH THEIR CONSISTENT GOODNESS OF DESIGN AND POWER EQUIPMENT ARE ESPECIALLY ADAPTED FOR ACCEPTED

MODERN YACHT TENDERS

AND USE ON THE WATERS OF THE ATLANTIC COAST AND THE LARGE INLAND LAKES

THE GURNET DORY — 18½ TO 30 FT.—IS ABSOLUTELY SEAWORTHY—NON-CAPSIZABLE—SHALLOW DRAUGHT—FAST WITH LIGHT POWER—**"A GREAT LITTLE SHIP"** ONE OWNER CALLS HER. **USED BY THE U. S. GOVERNMENT** IN THE NAVY—LIGHT HOUSE—AND REVENUE CUTTER SERVICE.

THE CLIPPER LAUNCH — 25 TO 30 FT.—IS FAST, DRY, SEAWORTHY—10-12 MILES. LUXURIOUS MAHOGANY FINISH AND APPOINTMENTS—CORK LINOLEUM ON FLOORS—CORK CUSHIONS—ICE BOX— LOCKER SEATS.

OUR HULLS ARE BUILT DURING THE WINTER MONTHS BY DAY LABOR FROM AIR DRIED LUMBER—UNDER PERFECT FACTORY ORGANIZATION—NOT TO CUT THE COST, BUT TO PRODUCE A UNIFORMLY SATISFACTORY BOAT IN ALL DETAILS OF DESIGN—MATERIAL AND WORKMANSHIP. EVERY DOLLAR OF VALUE WHERE IT WILL COUNT THE MOST FOR YOUR PLEASURE.

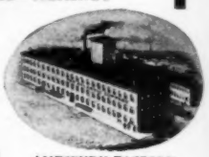
DELIVERIES SHOULD BE SPECIFIED NOW — SALES FROM THE BOSTON AND NEW YORK SHOWS WILL TAKE HALF OUR OUTPUT—THESE DELIVERY DATES ARE SCATTERED AND WE CAN STILL ENTER EARLY DELIVERY ORDERS. THE FARSIGHTED MAN WILL PLAN HIS BOAT EARLY—GET DELIVERY ON TIME. THIS IS FOR HIS ADVANTAGE.

MOTORS — THE FAMOUS ATLANTIC AND ATLANTIC SPECIAL — TROUBLE PROOF — WATER-PROOF IGNITION — NOISELESS UNDERWATER EXHAUST—THE SAME MOTORS WE SELL TO THE NAVY DEPARTMENT. LAST AWARD OF SEVEN 12 H.P. MOTORS JUST RECEIVED—AGAINST SIX OTHER BIDDERS, **A LIMITED NUMBER OF THESE MOTORS WILL BE SOLD SEPARATELY—FROM OUR HULLS.**

SPRAY HOODS

TO FIT ALL OUR BOATS OR MADE TO MEASURE FOR OTHERS—FROM GENUINE GOVERNMENT DIE 10 OZ. KHAKI DUCK—WITH BRASS FRAMES—MEASUREMENT DIAGRAM IN CATALOG S-4.

TO ENABLE SATISFACTORY REPLY PLEASE STATE REQUIREMENTS IN ASKING FOR CATALOG—**DORIES, D-4. CLIPPERS, C-4. MOTORS, E-4,**



AMESBURY FACTORY

THE ATLANTIC COMPANY **AMESBURY, MASS.**

BOSTON: 93 HAVERHILL ST. NEW YORK: 612-30 CHURCH ST. PHILADELPHIA: THE BOURSE.

"WHITE" MOTOR & PADDLING CANOES

are made of the best cedar, ribs and planking covered with canvas; spruce gunwales, white ash or oak stems and thwarts and brass-bang plates. The seams are beveled and lapped, making a smooth water-tight canoe, even before the canvas is put on. No cracks, no swelling or shrinking and the result is a stiff, strong, durable canoe. Ask for our descriptive booklet.

E. M. WHITE & CO.

OLDTOWN - MAINE

H. L. F. TREBERT'S LATEST—Sold Under a Positive Guarantee

For Racing Boats, For Semi-Racing Boats, For Pleasure Boats, For Hunting Cabin Boats, For Cruiser and Work Boats.

10 to 18 H. P., 2 Cylinder 4 Cycle
17 to 45 H. P., 4 Cylinder 4 Cycle
25 to 60 H. P., 6 Cylinder 4 Cycle
35 to 60 H. P., 4 Cylinder 4 Cycle
80 to 90 H. P., 6 Cylinder 4 Cycle

The power developed depends on No. of R.P.M. engine is run at.

Money back if you are not satisfied.

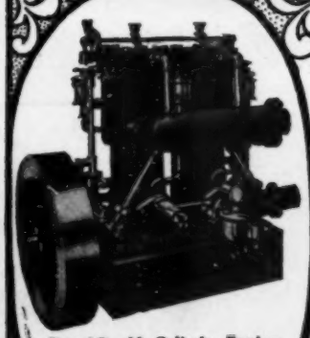
No weak parts or excessive gearing. All parts accessible and not a moving part exposed.

A noiseless, clean, beautiful, powerful, reliable, durable, self-oiling engine, free from vibration.

Not a moving part visible.

Send for Catalog

H. L. F. TREBERT, 405 St. Paul Street, ROCHESTER, NEW YORK



Royal Double Cylinder Engine

Made in three sizes as follows:

H.P.	Bore	Stroke	Speed	Weight
5	3⅜	4	650	235
10	4⅜	5	630	375
15	5⅜	6	525	500

RE-STARTING THE ROYAL ENGINE

Don't you ever "switch her off" to make a landing, to wait for another boat, to try out a fishing ground, to take a shot or for any other old thing?

How about re-starting?

You don't even have to swing the wheel of a ROYAL double cylinder engine in such cases. Just snap either of the igniter points and she will start immediately after any stop of an hour or less.

This is another feature symbolic of ROYAL efficiency throughout.

Send for our 1910 Catalog

THE ROYAL ENGINE COMPANY

117 Housatonic Avenue, Bridgeport, Conn.

Royal Single Cylinder Engine

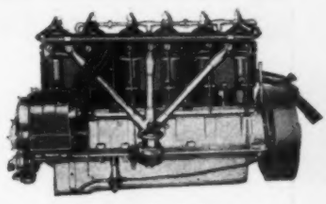
Made in three sizes as follows:

H.P.	Bore	Stroke	Speed	Weight
2½	3⅜	4	650	115
5	4⅜	5	630	220
7	5⅜	6	500	300

ONE HUNDRED DOLLARS IN GOLD TO THE OWNER
THIS SILVER TROPHY CUP SUITABLY ENGRAVED, TO THE DESIGNER FOR

THE FASTEST MILE 1910 WITH THE

REVILLION LIGHT SIX-THIRTY



NO STRINGS ON THE OFFER—BOATS OWNED BY MEM BERS OF THIS COMPANY BARRED—TIME TO BE TAKEN AT A REGULAR CLUB EVENT, WITH THE START ANNO UNCED AS IN THE CONTEST—DETAILS AND TIME CERTIFIED TO BY OFFICIAL TIMERS.
THE OBJECT OF THIS CONTEST IS TO DEVELOP THE FASTEST TYPE OF HULL FOR THIS MOTOR,

THERE IS NO OTHER SIX CYLINDER MOTOR AS LIGHT—OR EQUAL POWER FOR WEIGHT—HERE ARE SOME OF THE GOOD POINTS

REVERSE GEAR INTEGRAL—REMY HIGH TENSION MAGNETO, GEAR DRIVEN, DOUBLE IGNITION—SCHEBLER CARBURETOR—ALUMINUM BASE—NICKEL STEEL DROP FORGED CRANK SHAFT, OIL TREATED—NICKEL BABBITT DIE CAST REPLACEABLE BEARINGS—BALANCED PISTONS—ECCENTRIC TURNED RINGS—DROP FORGED CONNECTING RODS—POSITIVE FLUSHING LUBRICATION OIL CIRCULATING PUMP—LARGE VALVES IN HEAD—VALVE CAGE REMOVABLE BY LOOSENING ONE NUT.

PRICE THE SENSATION OF 1910 CATALOG R-4

6 CYLINDER 30 H. P. LIGHT SIX-THIRTY 365 POUNDS **$445.00**

4 CYLINDER 20 H. P. LIGHT FOUR-TWENTY 285 POUNDS **$345.00**

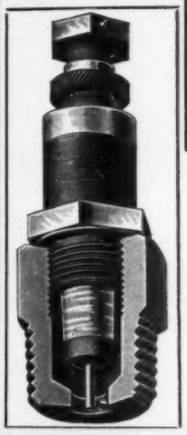
ELEKTRA—25 X 4 FT. 8 IN. 21½ MILES

DELIVERIES AT DATE OF THIS ADVERTISEMENT SOLD TO APRIL 1ST, 1910. THEN ONE PER DAY TO JUNE 1ST. AFTER THAT DATE PRICE ADVANCES. YOUR DEPOSIT WILL HOLD A DELIVERY DATE FOR YOU.

DUPLICATES OF THIS BOAT—WHICH WAS EXHIBITED AND SOLD AT THE NEW YORK SHOW, MAHOGANY PLANKED AND DECKED—AUTOMOBILE CONTROL. **$1250.00**

SPECIAL SPEED HULLS TO ORDER

THE ATLANTIC COMPANY, AMESBURY, MASS.
BOSTON: 93 HAVERHILL ST. NEW YORK: 612-30 CHURCH ST.
PHILADELPHIA: THE BOURSE.



COMET Spark Plugs

SOOTLESS Spark Plugs

THE FOLLOWING JOBBERS HANDLE COMET and SOOTLESS SPARK PLUGS

NEW YORK
WYCKOFF, CHURCH & PARTRIDGE
CHARLES E. MILLER.
THE WEAVER-EBLING AUTO CO.
TIMES AUTO SUPPLY CO.
MUTUAL AUTO ACCESSORIES CO.
W. K. THOMAS
CHAS. H. BEECHER
H. J. HUSH
NEW YORK AND BROOKLYN AUTO SUPPLY CO.

PHILADELPHIA
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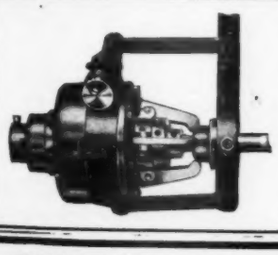

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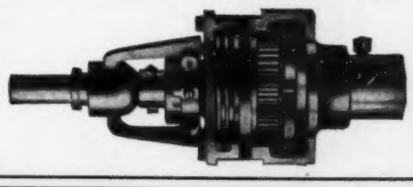

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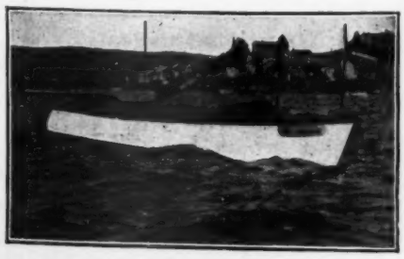

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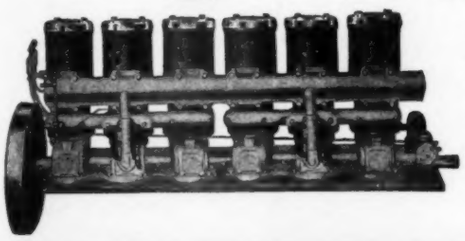

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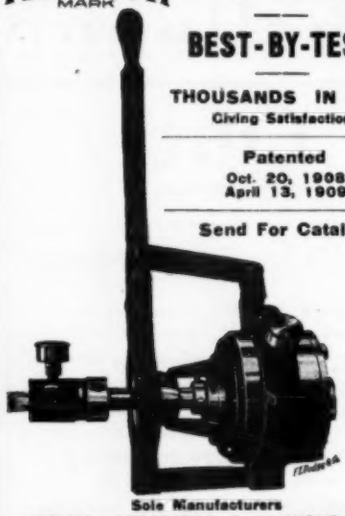

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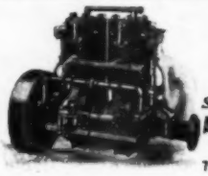
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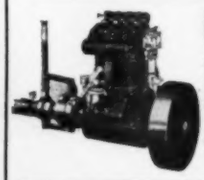
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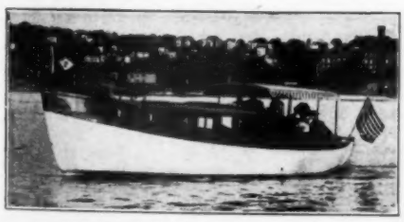

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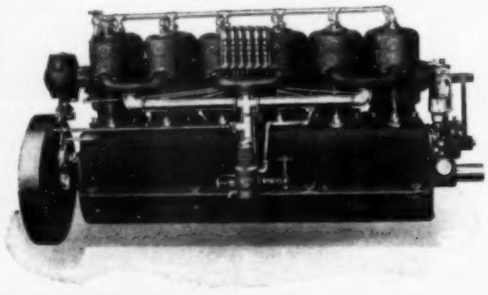

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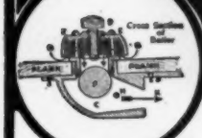

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will make it go. At the same time you can keep your boat free of bilge water.

The drag of bilge water which retards the speed of your boat is automatically eliminated. This bilge bailer lets water out but lets none in. It is built to last as long as your boat, and to require absolutely no attention. And it costs but $5.00. You are certainly willing to pay that trifle for an added mile or two speed to your craft and for a dry boat. For sale by all dealers in Marine hardware. Write us anyway for particulars giving speed of boat, draft, etc.

HOW IT WORKS

Water follows Course of Arrows, B. C. & H. and is left astern at K. The bailer above shown is for fast boats.

FOR SLOW BOATS

we have a special Slow Boat Bailer. Write for particulars.

The Automatic Bilge Bailer Co., Dept. E., 150 Huntington Avenue, Boston, Mass.

Demonstrator Agents Wanted in Every Community

16-ft. Steel Launch $96

Complete with Engine, Ready to Run

18-20-23-27 foot Launches at proportionate prices. All launches tested and fitted with Detroit two cycle reversible engines with speed controlling lever—simplest engine made—starts without cranking—has only 3 moving parts—anyone can run it. Steel Row-boats $20.00. All boats fitted with air tight compartments—CANNOT SINK, leak or rust—need no boathouse. We are the largest manufacturers of pleasure boats in the world and sole owners of the patents for the manufacture of rolled steel, lock seamed, concealed riveted steel boats. Orders filled the day they are received. Write for Free Illustrated Catalog and testimonials of 10,000 satisfied users.

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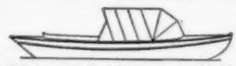
SPRAY  HOODS

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1 to 6 cylinders 5 to 35 H. P.

Manufactured by

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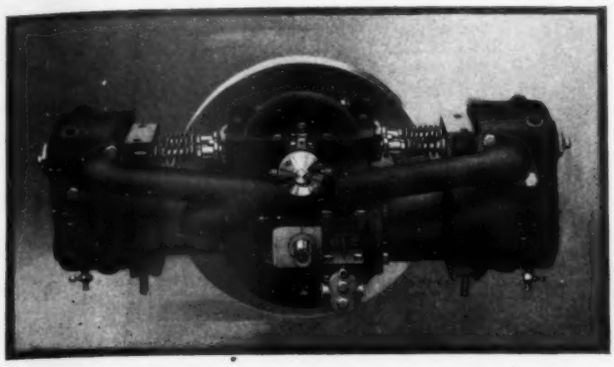

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Don't buy an engine or a boat on promises.

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Is mechanically correct both for high and low speeds. Must be seen and used to be appreciated. No springs. All working parts and areas accurately machined.

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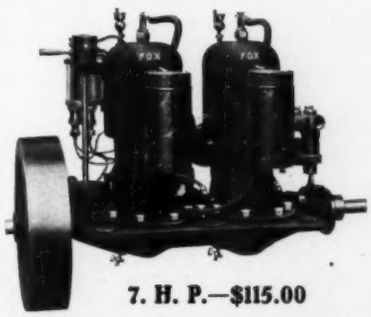

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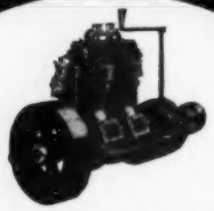

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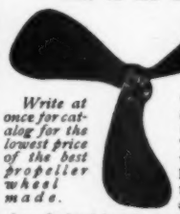

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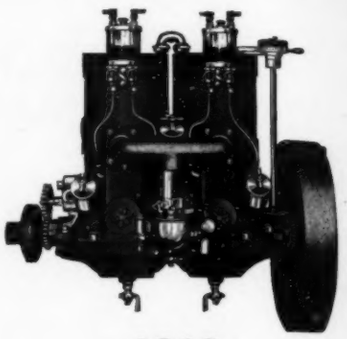

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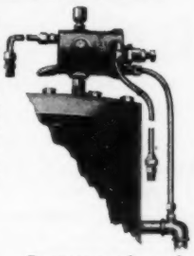

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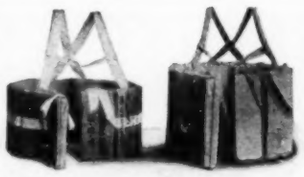

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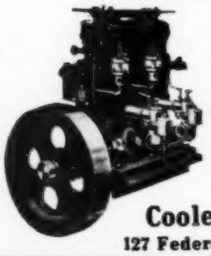

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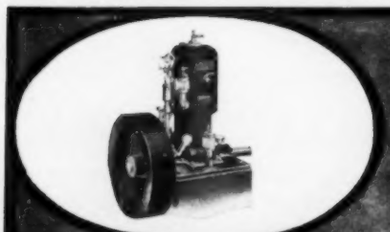

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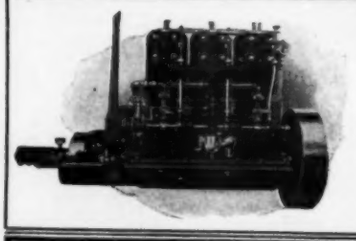

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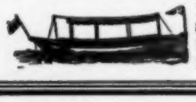

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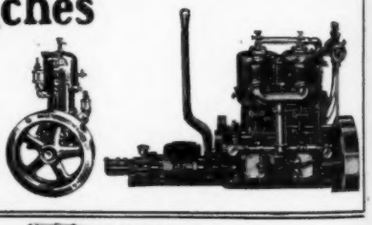

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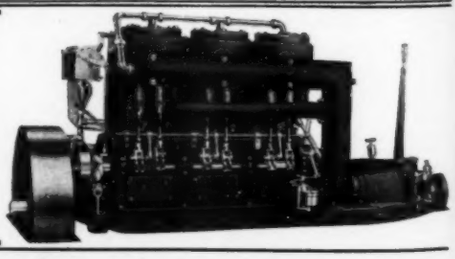

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It is designed and built to do just that thing---to give the motor the best "grip" on the water.

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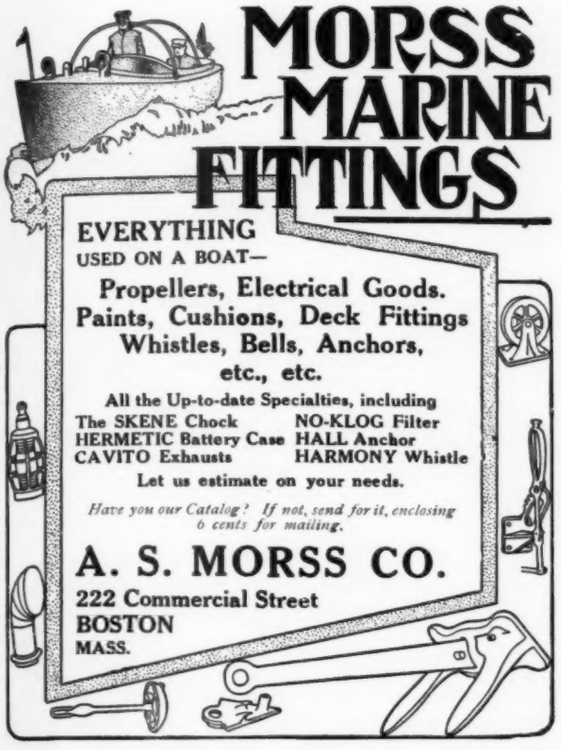
HYDE WINDLASS CO.
BATH, MAINE



MORSS MARINE FITTINGS

EVERYTHING
USED ON A BOAT—

Propellers, Electrical Goods. Paints, Cushions, Deck Fittings Whistles, Bells, Anchors, etc., etc.

All the Up-to-date Specialties, including

The SKENE Chock	NO-KLOG Filter
HERMETIC Battery Case	HALL Anchor
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Let us estimate on your needs.

Have you our Catalog? If not, send for it, enclosing 6 cents for mailing.

A. S. MORSS CO.

222 Commercial Street
BOSTON
MASS.

HURRY UP

Don't wait until the last minute to order your new speed wheel, reverse gears and marine hardware. The famous Michigan Line is used on some of the fastest and most up-to-date boats in the world to-day.

Now is the time to order before the rush season. Don't order until you receive our free catalog full of valuable information on propeller wheels and reverse gears.

Study this Ad.—We have a complete line of marine accessories for motor boats and engines which can be purchased direct from the manufacturer at prices that will appeal to every motor boat owner. We are the largest manufacturers, fully equipped, and can make shipments same day order is received.

Our Line is well known standard articles, we supply over 800 engine and boat builders. Why not you? We make more propeller wheels and reverse gears than all other concerns combined, and could not do this unless our goods were the best and gave entire satisfaction.

The Famous Michigan Speed Wheel is not made to meet the competition of an inferior and cheap article, but is made of the very best quality bronze, highly polished and balanced and will not bend or break under hard use. Will last for years and will give the very best speed results.

A post card will bring our catalog to you free. A letter with data concerning your boat and engine stating your requirements will bring our catalog free with advice as to the proper size propeller wheel and reverse gears to be used with your outfit to give you the very best results.

Michigan Wheel Co.

556 Canal St. Grand Rapids, Mich.

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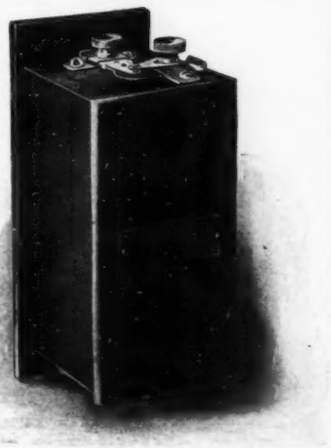

If you are satisfied with a coil that is out of commission a quarter of the time, that uses up your batteries quickly, gets out of adjustment easily, requires smoothing of the points every trip or so, one that takes the real pleasure out of your trip—we cannot interest you.

But— if you are **NOT** satisfied, then the **Osburn Coil WILL** interest you. It doesn't get out of adjustment, it uses but a small amount of current (batteries last again as long), the points don't freeze or stick, and it will not mar the pleasure trip. **It delivers the goods day or night.** Always there with the **hot, snappy spark** that's got the **heat** and **vim** to it. Fires most any kind of a mixture.

Specify an OSBURN COIL. Your dealer will get it for you—if not, write us direct. Remember, we do not **guarantee satisfaction** if you buy a **substitute.**

You take no chances with the Osburn Coil as we absolutely guarantee our windings against breakdown or short circuiting **forever,** and we will replace free of charge any coils which fail you.

You will be surprised at the SMALLNESS of the price.

We want a live dealer in every town. We have an attractive proposition. Write today for catalog showing our complete line.

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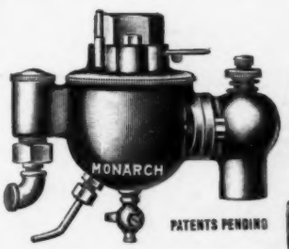
MONARCH CARBURETOR

FOR 1910



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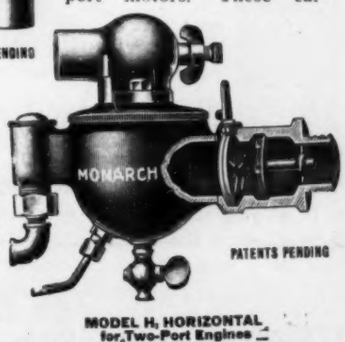
for Three-Port or Four-Cycle

THE 1910 Models of **Monarch Float-Feed Carburetors** show some decided improvements. They are made in two models, G and H. Model G is designed for three-port single and multiple-cylinder engines. Model H is designed for two-port motors. These carburetors are of correct design, and add to the efficiency of motors using them. They are fitted with a very practical and ingenious DISC THROTTLE, interposed between the check and the carburetor.



MODEL H, HORIZONTAL
for Two-Port Engines

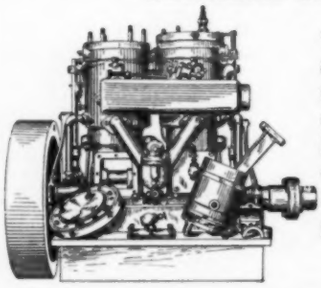
Write for full particulars, prices, etc.

MONARCH VALVE CO.

116 FRONT STREET **BROOKLYN, NEW YORK**

THE BRIDGEPORT

"The Motor That Motes"



The only motor in which all working parts are removable without complete disassembling,
Medium speed type—Liberal cylinder capacity—Large durable working parts.

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The Bridgeport Motor Co., Inc.
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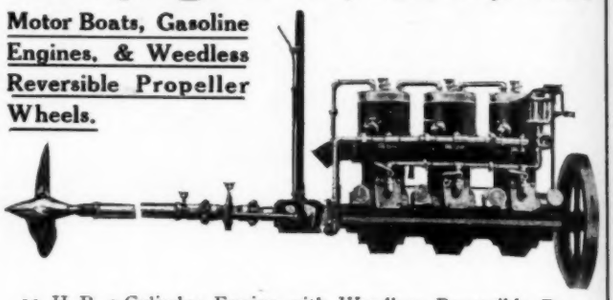
Motor Boats, Gasoline Engines, & Weedless Reversible Propeller Wheels.



12 H. P., 3-Cylinder Engine, with Weedless Reversible Propeller, Shafting, etc., $245.00. Engine without Propeller, $200.00. Engines guaranteed forever.

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The famous "La Truda," the fastest 32-foot boat in the world, won her title through a Columbian Speed Propeller. The installation of a Columbian Speed Propeller just before her famous race with Hoosier Boy added two miles an hour to her speed and won the contest.

What a Columbian can do for your boat

No matter how little the power that you have it will add speed to your boat. Write for "Propeller in a Nutshell."

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Freeport, L. I., N. Y.

Member National Association Engine and Boat Manufacturers.

No Cranking Required

To start FAIRBANKS-MORSE two-cycle Engines. Crank is included if you desire it, but you will have no use for it.

All danger from "Kick Back" eliminated.

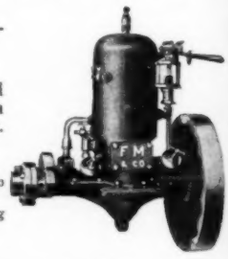
Large hand hole in Base.

Our Type "G" Engines have several exclusive features. Base explosion impossible. Automobile control, etc.

Sizes 6 H. P. to 45 H. P.

Type "E" Engines 3 to 7 H. P.

Four Cycle Marine Engines 4½ H. P. to 100 H. P.



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Light your boat with sunlight—or its equivalent

Henry J. Gielow
the famous engineer and naval architect says:

"The Acetylene plant you installed in the "Hawaii" (a 111-ft. boat) six years ago has been in constant use ever since then and has given absolutely no trouble. I have had your system installed in a number of other yachts with equally good results, so I do not hesitate to recommend it to any of my clients who consult me on the subject."
(Signed) H. J. GIELOW

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The "equivalent" or substitute for sunlight is brighter than electricity and cheaper than oil, is suitable for big boats and little boats, for power boats and sailing craft, for cooking as well as lighting, and is absolutely safe to use. The

Acetylene Safety Storage System

has the sanction of the National Fire Underwriters and the U. S. Steamboat Inspection Service; is used in the boats of the U. S. Revenue Cutter Service, the Coast and Geodetic Survey, the Department of Commerce and Labor, and by hundreds of the most prominent yachtsmen in the country. Our catalogue tells the advantages of the *Safety Storage System* over all other forms of boat-lighting. Drop a postal for a catalogue—now.

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Loveland Marine Motors are Guaranteed for 5 Years

That's a long time, but it's a guarantee that we've never been asked to make good on.

Single cylinder; two cycle; reversible; sparking system absolutely waterproof; no valves; no gears; no automatic sparker or springs; no anything that is troublesome or unreliable.

The Loveland single cylinder, two cycle motors are made in 2, 4½ and 7 h. p., and while they are high quality all through they are low priced.

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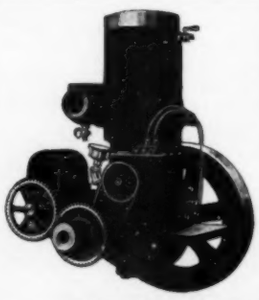
Largest Manufacturers of Ignition Apparatus in the U. S.
188 St. Clair St. DAYTON, OHIO



1910 MIANUS

NO BATTERY NO SPARK COIL

The Mianus Motor is not a new idea or a freak but a gradual growth of thirteen years

Medium weight Moderate speed
Nickel steel forgings, bronze bearings

BUILT TO LAST A LIFETIME

Sizes 3 H.P. to 15 H.P. See 1910 Catalog

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"PERFECTION" ENGINES

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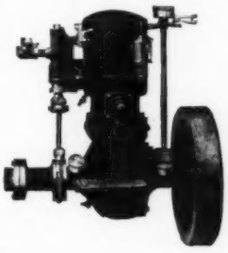
Embody the latest improvements in Marine gasoline engine construction. If you are an expert you will find in the "Perfection" just the features you want; well balanced design—high grade materials—perfect workmanship, finest equipment. Everything that makes for ease of operation, speed, strength and durability—and the finest finish ever put on a Marine engine. "Perfection" engines are painted with three coats of handsome Blue Enamel, striped in Gold and Yellow; the whole finish baked on.



2 H.P. $48
Complete---
ready to install.

All sizes, 2 to 25 H. P.; 1 to 4 cylinders. We replace any Perfection engine that isn't entirely satisfactory. Fine new Catalogue illustrates every part. Tells what you want to know about a gasoline engine. Send for it.

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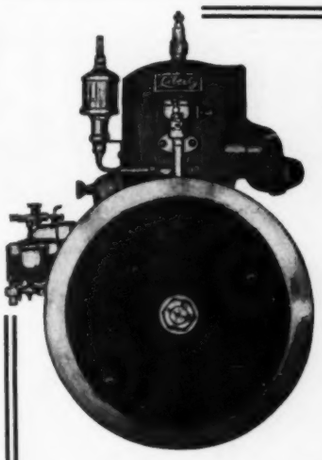


THE
LIBERTY

1½ HP., 2½ HP., 3½ HP., 6½ HP.
Single Cylinder Motors
7-8 and 12-14 HP.
Double Cylinder Motors.

HERE IS AN OFFER WORTH CONSIDERING

WE WILL FURNISH YOU A GUARANTEED 6½ H. P. MOTOR FOR **$100**

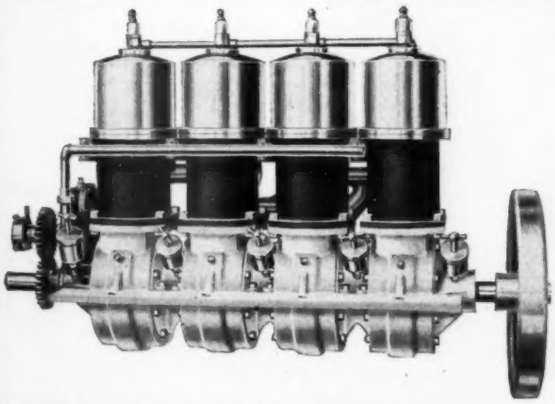
This price includes:

Engine, sight feed lubricator, "Schebler" carbureter, bronze pump, grease cups, elevated brass timer with reversing lever, drain and relief cocks, flanged couplings, ball thrust bearings, 15" three-blade bronze propeller, six feet steel shafting, bronze stuffing box, guaranteed spark coil, mica spark plug, jump spark wire, battery wire, knife switch, one set (6) dry cell batteries, battery connections, lag screws, muffler.

SPECIFICATIONS.—Bore 5", stroke 4½", weight complete 200 pounds, crank shaft 1⅝" drop forged steel, fly wheel 16" in diameter, water jacketed exhaust with muffler, brass vertical plunger pump with both check valves enclosed, "Liberty" improved system of oiling, propeller shaft 1". Rated 6½ H.P. at 750 revolutions per minute.

Our Naval Architect Department furnishes you plans for any craft you want to build. These plans and templates are of especial interest to the small boat builder. ***Write for 1910 catalog.***

DETROIT AUTO SPECIALTY CO.
909-911 Greenwood Ave., DETROIT, MICH.



Develops 40-60 H.P. Weighs 167 lbs. Made also in 2, 3 and 6 Cylinder size.

If you want the engine that Develops the Most Power for Weight and Bulk, runs equally well at all speeds, and consumes gasoline and lubricant in exact proportion to the work it does, investigate

THE ELBRIDGE

It is the simplest, most reliable and handsomest motor ever built. Styles and prices to suit all boats and all pocket-books. Descriptive catalogue *Free.*

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have made good in Aerial Navigation.
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QUALITY

Everything in the Marine Hardware and Supply Line for Launches, Yachts and Motor Boats.

Catalogue with price list sent on request.

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ESTABLISHED 1871
CLEVELAND, OHIO

Some DURKEE Specialties
FOR YOUR MOTOR-BOAT

The New Durkee Bilge Pump
(Patent Pending)

is a distinct improvement over the other kind which looks so much like it. The length of hose which serves as an in-take allows the foot rest of the pump being placed on a locker, seat or deck, which means that the operator is not obliged to put a twist in his back to clean out every drop of bilge water. For washing decks and cleaning off an anchor on moderate-sized craft, the ease by which the in-take hose may be dropped overboard while the operator is standing on the deck is a mighty taking feature.

THE NEW DURKEE BILGE PUMP

The Durkee Power Whistle

gives a long, continuous blast or a series of short, sharp blasts—at will—and has great distance and penetrating power.

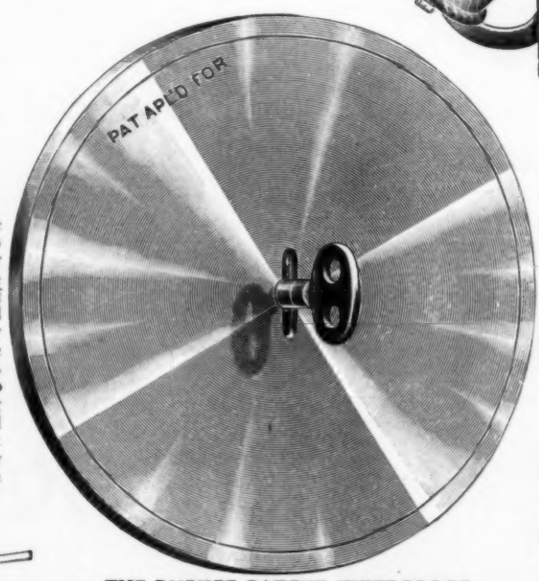
The Durkee Whistle is fastened near the rim of the fly wheel of the motor, and is operated by pulling whistle rope, which is attached to lever, bringing friction wheel in contact with the fly wheel of the engine.

The Durkee Wheel Control

The Durkee Wheel Control gives one person complete control of the boat, just as a similar method gives the driver complete control of an automobile.

The spark and throttle levers are situated within the rim of the steering wheel.

This method of control is the most satisfactory way of keeping in the hands of one person the operation of a motor boat.



THE DURKEE PATENT THIEF-PROOF DECK PLATE

The Durkee Patent Thief-Proof Deck Plate

There are two ways to open it—by a key or a jimmy. The fellow who steals gasoline can't follow this calling if you have one of these Deck Covers. You have the key. He may have a jimmy, but to work a jimmy makes a lot of noise.

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The Durkee Patent Keyless Deck and Hand Hole Plate

The Cap of this Deck Plate may be inserted without the use of a key of any kind. Instead of a thread to hold it in place, a couple of springs, actuated by studs in the flange of the cap, fit into a groove in the plate, and it may be inserted or removed instantly. This plate, in the 4-inch size, makes a particularly good hand-hole plate for covering the supply valve at the gasoline tank, which in many open craft can be approached only by removing the portable bulkhead.

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We—GUARANTEE—this Toilet Article for FIVE years

OL-SE-CO Automatic Liquid Soap Jar

FOR USE ON YACHTS AND MOTOR BOATS

No. 1
Price, $2.00.—Press the BUTTON and it flows into your HAND

The Automatic Jar and the Modern Way to Use Soap

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SAPONOL CHEMICAL CO.,
130th St. and Park Ave.,
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For 15 years the writer has been endeavoring to secure a soap which would remove the grease and other grime inseparable from the engine room.

In OL-SE-CO you have evidently a happy combination. It not only absolutely removes this dirt, but leaves the skin soft and pliable. As stated above I have seen nothing which can compare or be classed with it. What surprised me was that a delicate toilet article like OL-SE-CO would so effectually remove the hardest and stickiest accumulations of dirt that is encountered (that of the engineer). I have enjoyed the many benefits of OL-SE-CO and cannot recommend same too highly.

JAMES BRYSON,
Chief Engineer.

No. 4
Price, Complete, $4.00

No. 4 is a Combination Fixture made of brass heavily nickeled or oxidized, with drinking glass, screws, etc., ready to be placed in position. The pictures show the device; it is serviceable and always just where you can find it.

OL-SE-CO is individual for the Captain as well as his guests. Do not compel your friends to use "EVERYBODY'S" cake of soap, any more than you would expect them to wash their face in the same water you have used. It is both unfair and unsanitary when you have them "helplessly" at sea. Order direct through your dealer.

If it is Not Convenient to Have a Regular Soap Jar Then the Most Sanitary Way to Have Your Soap is in a Sprinkler Top Can

Put it in your grip, tool bag or box.
You will find it handy and clean.
For shampooing it is just what you want.

DIRECTIONS

Rub OL-SE-CO into the skin thoroughly, which will dissolve the grease, grime, dirt or dandruff; then rinse with water, hot or cold.

"That's All."

AUTO-CAN
Filled with Ol-se-co, 35 cts.

Order of your dealer or will be mailed by us direct upon receipt of 35c. in stamps.

SAPONOL CHEMICAL COMPANY

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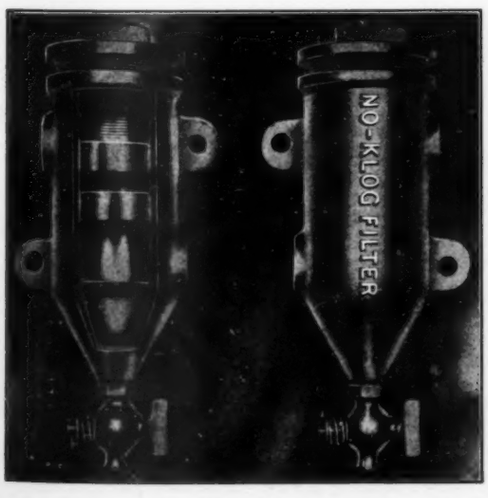
The No=Klog Filter

Is the one you will eventually *buy!* Buy it before some *cheap novelty* with a half dozen *joints,* a *glass;* or some other *freak* to leak around, has caused the *loss* of your *boat,* and possibly your *own life* as well as the *lives* of your *wife* or *children.* There is only *one real filter.* It is *safe;* it is reliable. *Guaranteed* in every detail. If not satisfactory return at *our expense* and get your *money back.* It extracts every particle of water and dirt that causes so much trouble.



Clogging and Flooding of Carbureters Impossible.

Wanted

One jobber ONLY in each State in the Union to handle the NO-KLOG FILTER, also one Dealer in each Foreign Country.

Department of Mechanical Engineering.
Brown University, Providence,
February 25, 1908.
The Standard Gasoline Filter Co.,
Attleboro, Mass.

Gentlemen: The "No-Klog Filter" made by you and recently submitted for trial has been put in use with satisfactory results.

Dirt and water placed in the gasoline supply for the purpose of trying the device did not interfere in any way with the running of the engine to which the device was attached.

Very truly,
WM. H. KENERSON,
Assoc. Prof. Mech. Eng.

Our patent covers the gravity flow which supplies gasoline without pressure under all conditions, always serving as an auxiliary reservoir. Other filters now on the market with an upward flow of gasoline will not admit of a steady feed, as without pressure the pitching of a boat in a seaway will absolutely cut off the gasoline supply, rendering the engine unreliable and such filters actually becoming a detriment rather than a benefit.

THE STANDARD GASOLINE FILTER CO.

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SPARK COILS

of Every Description

A guarantee for one full year's usage and of greater economy and longer service than any other coil, goes with all New York Spark Coils.

SINGLE BOX COIL

New York Spark Coils

The New York Coil Co. is one of the oldest spark coil manufacturers in the United States.

Long years of experience has taught this concern to make coils that are universally recognized as the standard of the world.

Spark Coils of every kind for every kind of use—for motor boats and automobiles—for 1, 2, 3, 4 and 6 cylinder motors—Dashboard Coils and Box Coils—made in interchangeable units. Send for complete catalogue of these famous coils.

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STA-RITE

"STAYS RIGHT THE LONGEST."

SPARK PLUGS

are guaranteed. We agree to place in as good working order as when new, any "STA-RITE" Ignition Plug AT ANY TIME when returned prepaid to our factory—FREE OF CHARGE.

"Vulcan" Type of "Sta-Rite" Porcelain Ignition Plugs

Double porcelain. Easily separable. The contraction and expansion is uniform, the porcelain cap protecting the inner heated tube. Practically no breakage or leakage with "Vulcan" Sta-Rites.

No. 4A. Half-inch (pipe thread), ⅝-inch long over threads.

No. 6A. Metric.

No. 8A. A. L. A. M., ⅞-inch, 18 threads.

No. 15A. Half-inch long, 1¼-in. long over threads. Porcelain tube, complete with bolt, packings, nuts and porcelain cap for any size plug. Price 50 cts.

Price, any size plug, net, $1.00

"Venus" Type of "Sta-Rite" Mica Ignition Plugs

All "Venus" Sta-Rite Mica Plugs are constructed with solid bolts from Bessemer steel rods, which do not stretch, and mica does not loosen. The inner India mica core is made with no shellac or other sticking substance. The perfect mica washers are compressed under great pressure, and machine turned to a finely glazed surface which, with ample air space, is practically soot and water proof, and cannot be broken in service.

No. 28A. A. L. A. M., ⅞-inch, 18 threads.

No. 32A. Half-inch (pipe thread), ⅝-inch long over threads.

No. 48A. Metric, copper gasket spun over shoulder. Mica Insulator, complete with bolt, nuts and bushing. Price 50 cts.

Price, any size plug, net, $1.00

"VENUS"

THE R. E. HARDY CO.

(Incorporated 1900)

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Gritless, Dripless GRAPHITE LUBRICANTS

ORDINARY oils and Greases are SOMETIMES efficient. Graphite Lubricants—if correctly prepared—are ALWAYS efficient. U. S. G. CO.'S MEXICAN GRAPHITE CUP GREASE is carefully and scientifically put together and contains just the correct proportion of finely POWDERED graphite, air-floated, absolutely gritless and for lubricating purposes very superior to the "flake" graphite used in similar preparations. Will not gum, harden or dry up, and retains original consistency in all temperatures.

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AMERICA'S STANDARD FOR GAS IGNITION

Do you realize that the initial cost of a battery is the smallest consideration in the purchase of dry cells?

You buy batteries for the service they will render and the price of the battery to you, depends upon the length of the service. If you want Quality and long life you will ALWAYS USE AMERICA'S STANDARD—THE AUTOCRAT.

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WATER-PROOF AND PROOF AGAINST INTERNAL SHORT CIRCUITS

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Very Highest development of marine water closets for use above or below water line, 4 inch cylinder discharges contents at third stroke, suitable for heavy work or owner's room. Will outwear any other closet, the gear makes it very easy working.

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Use No. 1 Extra Quality for deck seams of Yachts and Motor Boats.

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Time has proven it a success *and*, has also produced many imitations. Ten years have proved the worth of

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We guarantee to refund the amount of this bill, if at the end of the season there is any sea growth on the bottom of the boat, on which two coats of our B. B. paint has been properly applied.

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The Bridgeport Bronze Marine Paint Company

It stands one year without growing grass or barnacles.
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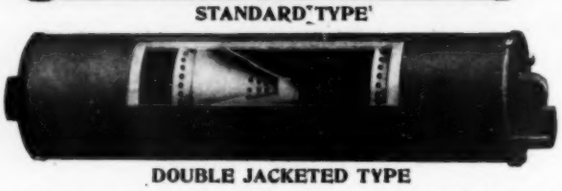
THE RECOGNIZED STANDARD MUFFLING DEVICE.

STANDARD TYPE



DOUBLE JACKETED TYPE

After 23 years Peary discovered the North Pole. Then there was a question as to whether or not he was the first.

After a thorough test, the Ferro Machine & Foundry Co., the largest marine engine builders in the world, discovered that the Ejector Muffler was the best on the market, and there is no question as to its superiority.

High-grade engines require high-grade accessories.

THE ADAMS LAUNCH & ENGINE CO.,
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We have a measured course on the bay here, 2¼ miles long, and with the ordinary Muffler I could run over this in seventeen minutes (8 miles per hour), and yesterday with the Ejector Muffler attached I made the distance in fifteen minutes flat, (9 miles per hour). Needless to say I am more than pleased with the Ejector Muffler in that it is almost noiseless, and gives me more speed.

Yours truly,
H. G. SKELSEY, Manager.

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To Polish the Metal Trimmings—**SOLARINE** works like Magic—It does not varnish over—It does not seek to add its lustre by covering up spots and tarnish, but by cleaning, brightening and bringing out the BEST that is in the metal itself. Solarine lustre is LASTING though easiest and quickest produced.

There is nothing else like SOLARINE
So there can be nothing as good.

Put up in screw top cans from one-sixth pint to gallon. "Every drop a shine." Either Black or White color.

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Instantly—no matter whether it is gasoline, oil, or the most inflammable thing known.

"PYRENE"

It will even put out an electric arc.

You should have one in your boat or auto—hundreds of other owners have. It is approved and used by the New York Fire Department and in the United States government service.

Pyrene is a chemical fire extinguisher that will not freeze, never loses its strength, will not injure anything it is thrown on, requires no attention or recharging until entirely used, instantly *smothers* any kind of fire, and is absolutely a non-conductor of electricity.

Pyrene Manufacturing Co.
34 West 33d Street New York City

Think how smart your boat would be with "COLUMBIAN" Yacht Rope, which is so smooth and bright that every strand glistens like polished silver in the sunlight.

Have a surprise party this year by using "COLUMBIAN" Yacht Rope. You will be surprised with the improved appearance of your boat, and your friends will marvel at the individuality imparted to your boat by such fine Cordage. Every sailor who takes pride in the smart appearance of his craft will use no other Rope if once he sees "COLUMBIAN" Yacht Rope.

Won't you be disappointed if the other fellow's boat is rigged out better than yours? Insure against it by ordering "COLUMBIAN" Yacht Rope now.

"COLUMBIAN Rope wears like Rawhide."

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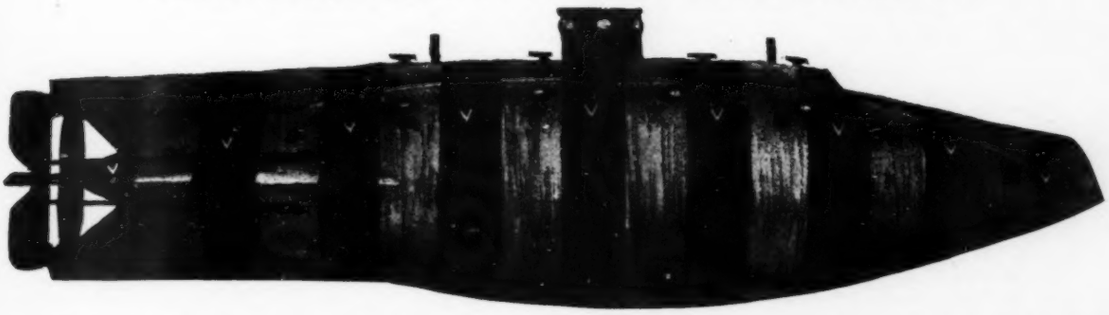
THE STRIPES ON THE SUBMARINE PROVE *That*

VALSPAR

IS THE ONLY VARNISH THAT CAN STAND WATER

READ CAREFULLY: IT'S AN INTERESTING STORY.



Bands marked V are VALSPAR. Bands marked 2, 8, 6, 4, 7, 9, 11, 3 are other makes of SPAR VARNISH

This MODEL SUBMARINE BOAT, painted black from stem to stern, then varnished on alternate sections with VALSPAR, and the other eight best known Spar Varnishes on the market and submerged in a tank of water, tells the story more plainly than many words:

VALSPAR Will Not Turn White

The others—all others—WILL, some quickly, some slowly, but the end of the Test leaves VALSPAR alone unharmed—its Color, its Brilliancy, its Hardness, its Durability intact.

10 SUPERIORITIES OF VALSPAR

In Comparison with other Spar Varnishes

1. **Valspar positively will not turn white** when exposed to rain or moisture.
2. **Valspar dries the quickest.** The nature of the weather has no effect on the drying of *Valspar,* which dries dust free in two hours.
3. **Valspar dries the hardest.** It becomes hard enough over night to handle, and when hard, is exceedingly tough, and therefore, not easily marred.
4. **Valspar is the most waterproof.** Even when continuously immersed in fresh or salt water it remains unharmed.
5. **Valspar may be rubbed** in twenty-four hours with powdered pumice and water for succeeding coats, if desired, and in forty-eight hours it may be rubbed down for a flat finish.
6. **Valspar is the most resistant to the action of alkalis, acids, oils, etc.,** making it invaluable for use in bathrooms, kitchens, stables, etc.
7. **Valspar is the palest** and will not therefore obscure the beauty of delicate colors or of finely grained woods.
8. **Valspar is the heaviest bodied,** and yet works easily and flows freely, giving a very full brilliant coat.
9. **Valspar is the most brilliant** even when first applied, and it **wears bright.**
10. **Valspar is the most durable** and weather-proof, being unaffected by heat or cold, or the influence of sun or rain, and it retains its luster to the end.

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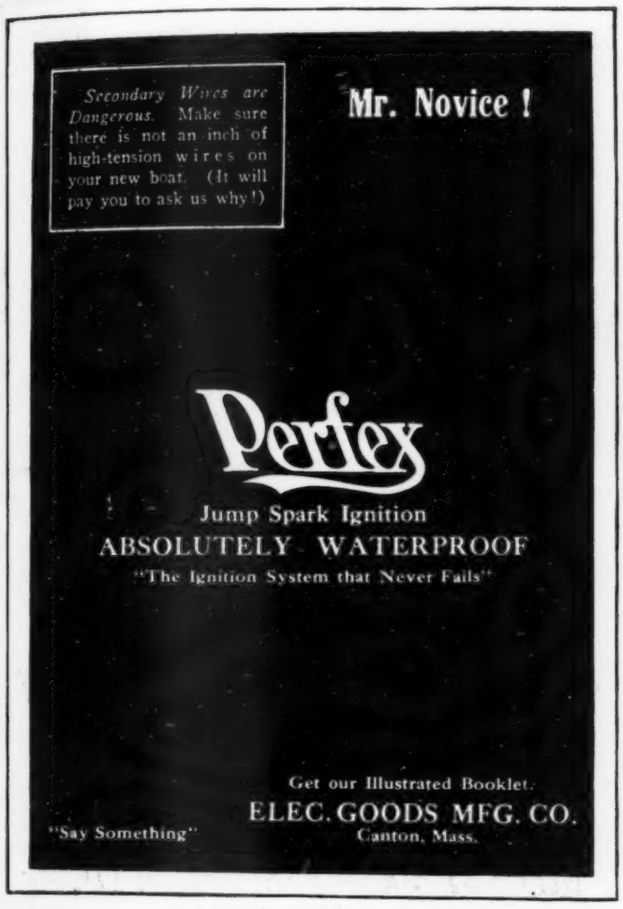
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"The Ignition System that Never Fails"
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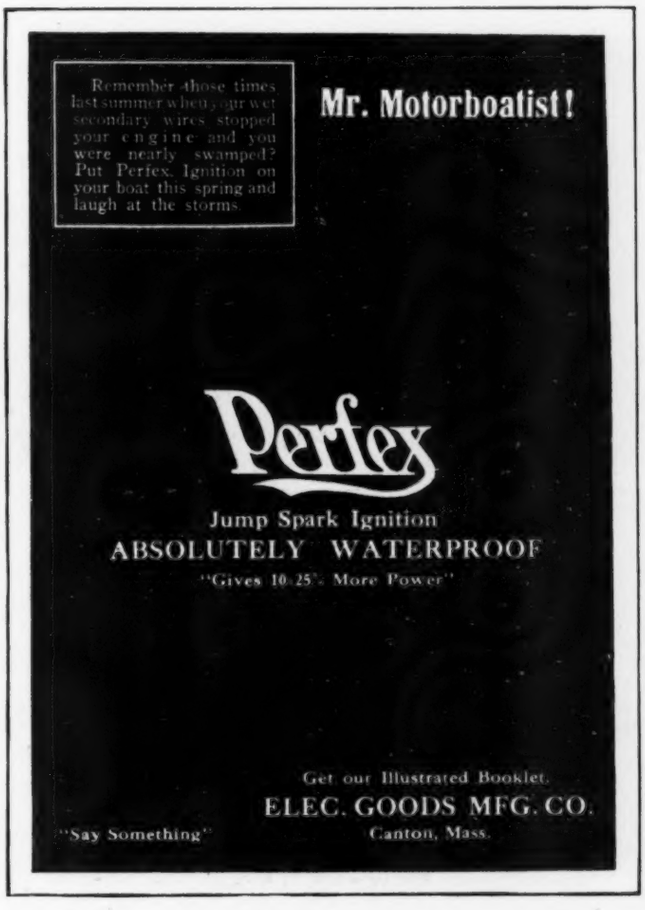
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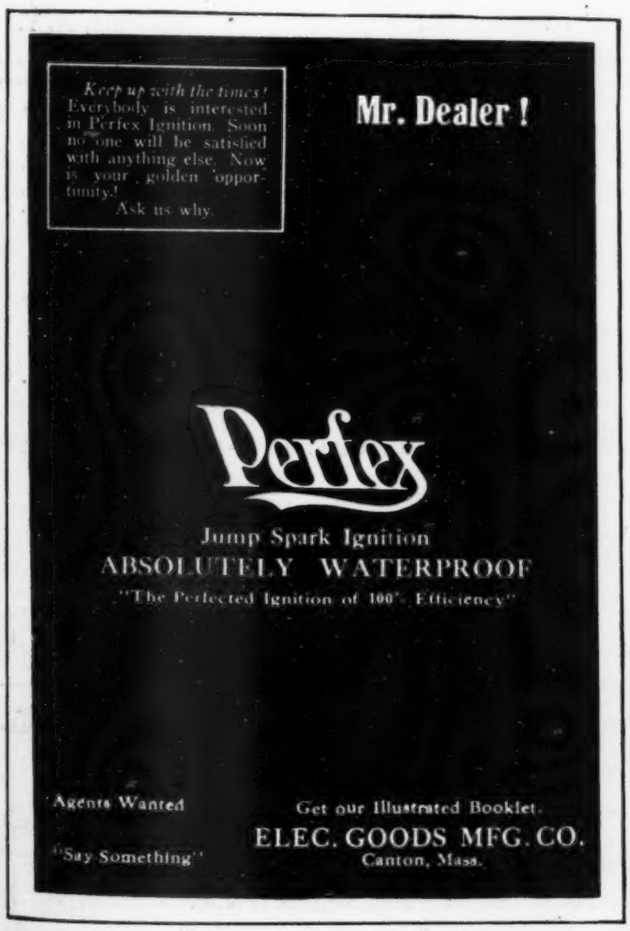
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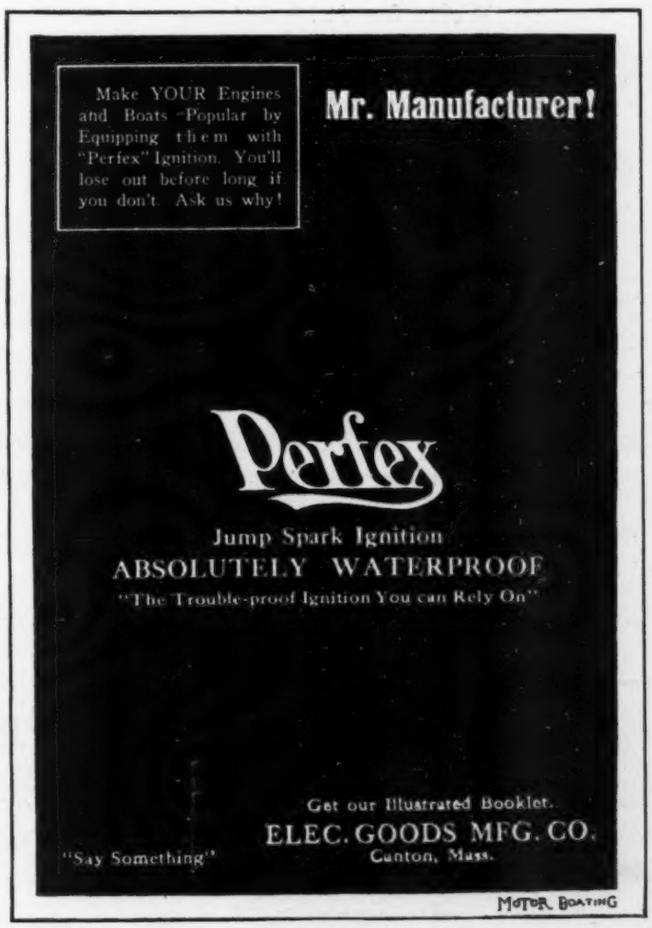
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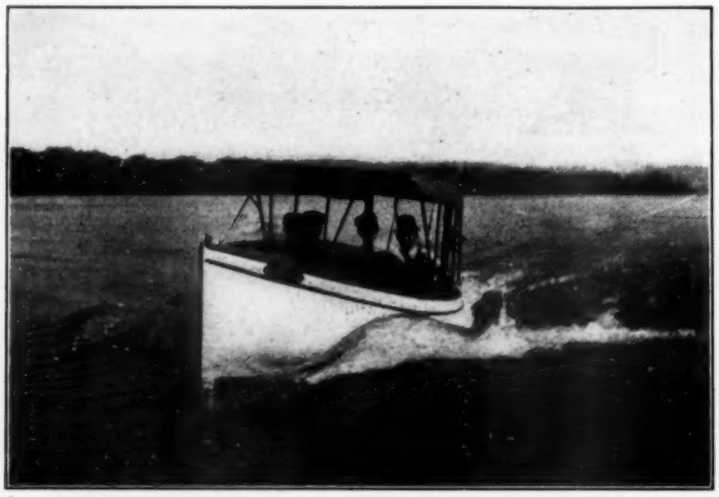

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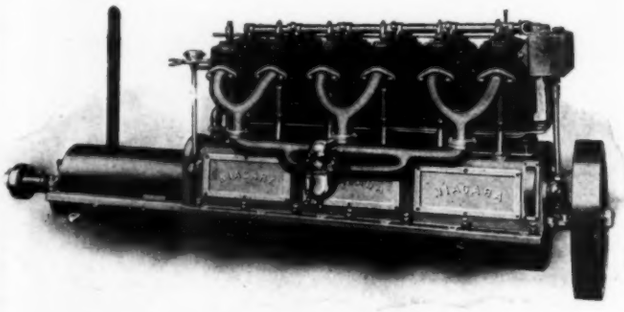
¶ Eight sizes in thirteen different equipments, ranging in price from $147.50 to $925.

¶ Our new catalogue will be from the press by the time this advertisement is in your hands. You cannot afford to buy a boat without seeing it.

¶ Meet us at the Chicago Boat Show, and see the finest line of boats ever exhibited,

¶ Or write Dept. 11,

OUTING BOAT CO.,
Front and Second Sts., Ashland, Wis.



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NIAGARA MARINE MOTORS

BUILT FOR

Power, Reliability, Strength & Durability

Built in Sizes 5 to 100 H. P.

2-4-6 cylinders completely water jacketed
Water jacketed exhaust pipes

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For DECK and all other SEAMS

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Weather checks, Floors, Bedding and Glazing of Skylights, Conservatories, Pointing of Stone Work, in fact, in all places where a perfectly tight joint is wanted, use **Elastic Seam Paint** and **Elastic Seam Composition.** The *Elastic Seam Composition* is made in white, black, gray and yellow, and to order in all colors.

Sample sent on receipt of thirty cents in stamps
Send for new booklet.

ELASTIC GLOSS YACHT WHITE

The whitest gloss white in existence. Works as smooth as oil paint. Dries in from 6 to 12 hours. Withstands acids and gases, will retain its gloss the entire season. Can be touched up any time without showing. One coat over a coat of *Elastic Flat Yacht White* will last all season. **Price, $4.00 a gal.; $2.00 a half gal.**

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It is the whitest yacht white. In spreading and covering unsurpassed. Dries in one to two hours. Withstands acids and gases. Withstands hard usage and scrubbing. Two coats are sufficient all season. **Price, $3.00 a gal.; $1.60 half gal.**

Elastic Special Bright Green Copper Paint | **$3.00 per gal.**
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Carborundum Valve Grinding Compound Positively Assures a Perfect Valve

Made of Carborundum powders and high grade grease. Put up in two collapsible tubes—one containing coarse mixtures for first rough grinding, the other containing a fine mixture for finishing.

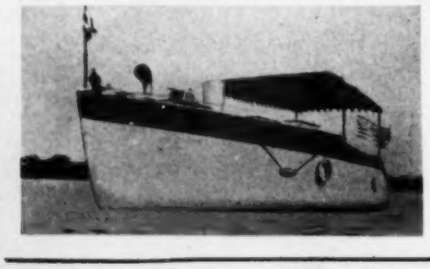
With each outfit is a package of Carborundum cloth strips for cleaning carbonized matter from contact or vibrator points and a book of Carborundum cloth for general use about the engine.

Carborundum powders are hard, sharp, quick cutting—produce a positively true contact seat.

For those who prefer to mix their own compound, the dry powders are offered in half-pound tins. The powders can be mixed with any good grease or light oil.

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

Outfit containing two collapsible tubes, cloth strips and booklet, packed in neat cardboard box, complete.....75c
Outfit containing two half-pound tins, coarse and fine grain, cloth strips, booklet, packed in neat cardboard box.....75c



Sold Completely Equipped for $750.00.

Length, 30 ft. Beam, 8 ft. 3 in. Draft, 26 in. Berths and full living accommodations for six. We include every item of equipment—whistle, bell, signal lamps, anchor and cable, stove and full galley equipment, ice box, fresh water tank, cushions chase leather covered and cork filled, marine closet, lavatory—in fact, every item of equipment necessary for extended cruises, except provisions and dishes.

This boat is a veritable summer home for a family of six.

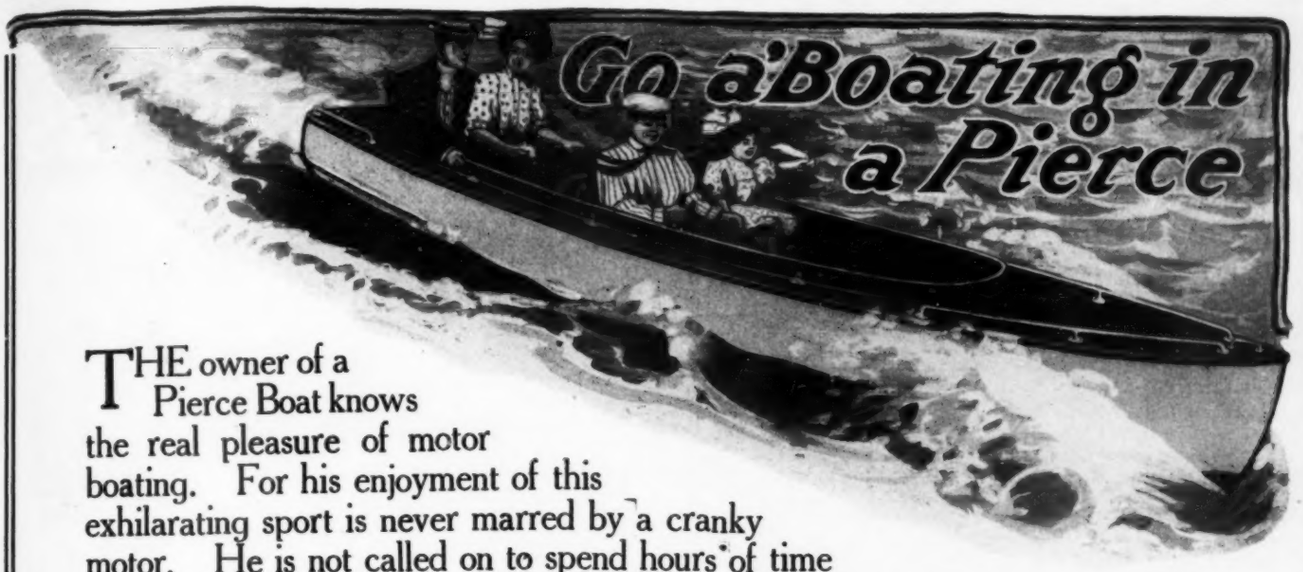
It is seaworthy in every sense of the term, and is capable of making any port on the Great Lakes or ocean voyages.

It is fitted with 12 H.P. motor and reverse gear. Throttle, timer levers, control and reverse lever are brought up to the steering wheel, making a one-man control.

Boats of all classes and sizes, complete or K. D.

Get our catalog, without fail, if you are in the market for a boat.

DeFOE BOAT & MOTOR WORKS. 2222 State St., Bay City, Mich.



THE owner of a Pierce Boat knows the real pleasure of motor boating. For his enjoyment of this exhilarating sport is never marred by a cranky motor. He is not called on to spend hours of time tinkering with his engine when he should be skimming over the water drinking in the pure fresh air. The owner of a Pierce has perfect faith in his boat. He knows that it can always be depended on to *get him there and back.*

Every Pierce Boat is Propelled by a Famous Pierce Engine

¶Made under the personal supervision of Mr. A. J. Pierce, who for 25 years has enjoyed an International reputation as a builder of high efficiency engines.

¶These speedy, dependable, economical motors are noted for their quietness while running. They never rack your nerves with the constant throbbing and jarring that so often accompanies the operation of other motor boat engines.

¶With the exhaust under water, at high or low speed, they run as quietly as a sewing machine.

¶But the Pierce Engine is not the only advantage of a Pierce Boat.

¶The hulls like the motor are made in our factory from A1 material and are the superior product of expert designers and skilled workmen. All Pierce Hulls are built on frames so they do not vary a hair's breadth from the perfect original model.

¶The 22-foot express type launch shown above is built along the very latest lines, has copper and brass fastenings throughout, large roomy cock pits, is beautifully finished and is capable of considerable speed.

¶The engine is placed well forward and out of the way of passengers but readily accessible in case of need.

¶The price, $700, includes complete equipment *such as listed as "extras" on other makes.*

¶Whether you spend your outing on lake, river or at the seashore, a Pierce Boat will insure you the greatest pleasure.

¶We have a boat for every need in stock.

¶Secure a copy of our handsome catalog to aid you in your selection. Write to-day.

PIERCE MOTOR COMPANY 200 22nd St., Racine, Wis.

"DETROIT"
VALVELESS, FORCE FEED
OIL PUMP

We are lubricating device specialists. Ours is the largest plant in the world devoted to the manufacture of lubricating devices.

We know the problem of motor-boat engine lubrication — and have solved it in the simple, economical, dependable, efficient *Detroit Valveless Force Feed Oil Pump.*

A VALVELESS PUMP operating with engine running in EITHER DIRECTION, therefore especially adapted to service on two-cycle motors. Furnished in any number of Feeds and any style of Drive required.

NO CHECK VALVES to interfere with operation. Has continuous sight feed, visible from above. All mechanism except driving shaft attached to cover, faciliating quick removal for inspection, etc., without draining oil. Feed Regulation simple and effective. A three-quarter turn of adjusting button changes the quantity of oil from nothing to full capacity. Height of oil in reservoir indicated by DIAL REGISTER on cover or by conventional Gauge Glass if preferred. Pistons are carefully ground. We submit the "DETROIT" as the simplest, most efficient and economically operated motor boat lubricator now made. **Send for Circular No. A-63.**

TRADE MARK REG. U.S. PAT. OFF.

DETROIT LUBRICATOR COMPANY

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STRELINGER MARINE ENGINES

BUILT EXPRESSLY FOR HARD SERVICE

6 H.P. 4 Cycle

For more than 12 years "THE STRELINGER," the old reliable 4-Cycle Marine Motor, has stood for the best in Marine Gasoline Engines. A distinct success. First Quality in material and workmanship from fly-wheel to propeller. The MOST RELIABLE, DURABLE and ECONOMICAL Marine Motor made. The Engine that ALWAYS MAKES GOOD, because it is built right. Famous for *endurance.* Customers who bought the first engines writes, "It is as good today as the day it was purchased, always goes, and never gives any trouble, have not spent a dollar for repairs." That is the engine you want.

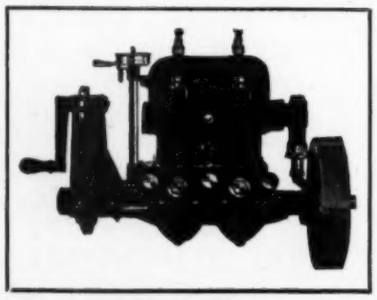
January, 1910, we purchased the United Manufacturing Company's Plant and will continue the manufacture of the "LITTLE GIANT" 2-Cycle Marine Motors. We can furnish you Engines from 1½ to 60 H. P. Agents wanted. Send for *Free Catalog* today. Send 10c for a nickel-plated pocket marine compass.

The Strelinger Marine Engine Co.

Nos. 171-175 Woodbridge St. West, Detroit, Mich., U. S. A.

L-A MOTORS
TWO PORT TWO CYCLE

Holder of the World's Record for Simplicity and Durability



6-8 H. P. TYPE C.

Our motors have all the accomplishments of their more complicated competitors, on less than one-half of their parts. There is absolutely no reason for loading a motor down with levers, push-rods, valves, etc., if you know how to do the trick without. Write for Bulletin J-5006 for information on the above motor.

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Lockwood-Ash Motor Co.

230-50 Horton St., JACKSON, MICHIGAN, U. S. A.

FERRO

The World's Standard Boat Motor

You can't afford to have in your motor boat any but the best engine built, because your satisfaction in boating depends on the reliability of the engine.

You take no chances if you use a Ferro. The Ferro motor is built strictly on a basis of highest quality—in design, in materials, in workmanship. Therefore, select the Ferro for greatest efficiency and reliability.

Write us for complete information on boats or engines. We are in position to give you expert advice.

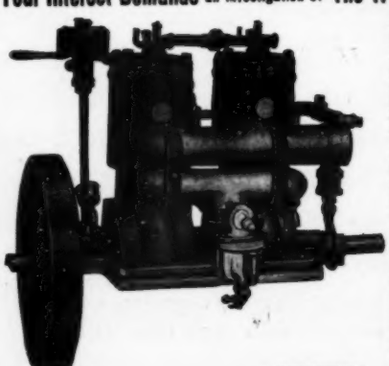
Ask for our Helpful Information Blank and let us make the motor problem easy for you.

Get this valuable free book on Motors—their construction and operation. *Write to-day.*

THE FERRO MACHINE & FOUNDRY CO.
Largest Marine Engine Builders in the World
Main Offices, 790 SUPERIOR AVE., CLEVELAND, O. New York Office, 44 CORTLANDT ST., 2nd Floor.

FERRO REPRESENTATIVES IN ALL PRINCIPAL CITIES AND PORTS

Your Interest Demands an investigation of The Wonder Marine Gasoline Engines



10 H. P. $200 COMPLETE 2 CYLINDER WEIGHT 200 LBS.

Attractive proposition for live representatives.

Smoothest running and most powerful engines for their weight that have ever turned a propeller. This is one of our latest engines and is ahead of anything else on the market. Complete with Schebler carburettor, Crouse-Hinds timer and silent muffler. Runs equally well in either direction. Is built to run and does it.

Superfluous weight is eliminated by careful designing, resulting in a steady, powerful machine. Will drive an ordinary 20 to 21-foot boat 12 to 16 miles an hour. Equipped with a plunger pump, which can be run in either direction without clogging.

We make engines from 1½ H. P. to 75 H. P., and they are all constructed in the same careful, thorough manner. There are 3,000 Wonder Marine Gasoline Engines throughout the United States. We say frankly you ought to investigate the Wonder Engines before deciding. Write for catalogue giving all details and price list. Prompt Shipments.

THE WONDER MFG. CO.
247 Tallman St., Syracuse, N. Y.
New York Agents, Universal Automobile & Motor Boat Supply Co., 15 Chambers St.

What's Happening Inside Your Motor?

Most cylinder oils are full of impurities that flash into granules of carbon with each cylinder explosion. The heat fuses these carbon granules into a solid coating that little by little encrusts the valve seats, spark plugs and cylinder heads, causes pre-ignition, and slowly strangles the power of the engine. By our process of filtration we have rendered

HAVOLINE OIL

freer of carbon-producing impurities than any other oil made.

Try one can of Havoline Oil on suspicion. Increase of power and surcease of motor troubles will convince you that

"It makes a difference"

To be had in 1, 5 and 10 gal. cans, half barrels and barrels at auto supply shops and garages, or direct from our main or branch offices.

Write for booklet on "Common Sense of Lubrication."

HAVOLINE OIL CO. 80 Broad Street 1906 Broadway **New York**

Chicago: 40 Dearborn St. **St. Louis: 4630 Olive St.**

Boston: 749 Boylston St. **Phila.: 1107 Real Estate Trust Bldg.**

W. P. Fuller & Co., Pacific Coast Agents

Pa-ha-ka Power Canoe $175.00

UNEXCELLED FOR

Beauty, Lightness, Speed, Stability & Comfort

WITH FOLLOWING EQUIPMENT:

2 H. P. Copper Jacket Engine; Schebler Carburetor; Galvanized Air Tanks, fore and aft; Rudder Shoe and Steering Gear; Brass Stem Bands, Yoke and Painter Rings; One Cane Morris Chair and Lazyback; Two Life Preserver Pillows and two Paddles.

Send For Catalog

C. M. JACOBSEN, *Boat Outfitter,* 50 WOODWARD AVENUE DETROIT, MICH.

Los Angeles Examiner's **Oriental Tour**

EMBRACING

Japan, China, Honolulu, Philippines

Sailing on the magnificent P. M. S. S.

"MONGOLIA" (27,000 Tons)

Leaving San Francisco Aug. 9th Returning Oct. 14th

***RATE FOR COMPLETE TOUR* $525**

Including every necessary expense of a high-class tour. First-class steamship, railway and hotel accommodations, guides, interpreters, carriages, jinrickishas, sedan chairs, steam launches and all expenses of side trips, under personal escort of an experienced traveler.

Itinerary upon application.

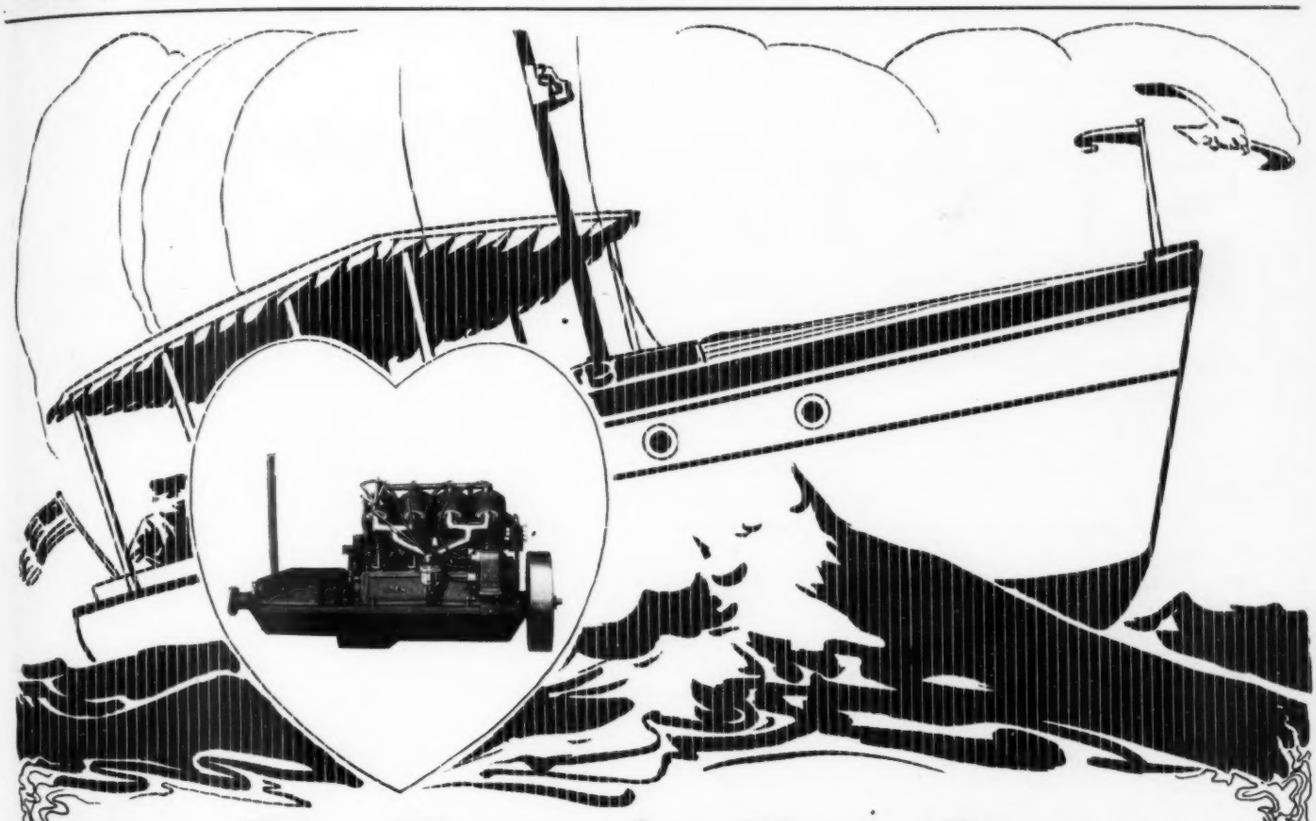
Make your reservations now and secure choice of cabins. ***Address:***

ORIENTAL TOUR EDITOR, Los Angeles Examiner

Los Angeles, California

N. B.—The Los Angeles Examiner, in response to requests from Japanese, Chinese and Philippine ports, and suggestions from prominent Californians, has devised this tour with the two-fold purpose of developing relations between the Orient and the United States and furnishing to desirable persons of this country an unexampled opportunity of studying the people and the important ports of the Orient at close range.

Unusual opportunities for sightseeing through official recognition of the importance of the party will be given its members.



The Heart of a Motor Boat

DURING the recent big Motor Boat Show at Madison Square Garden, the daily newspapers remarked upon the peculiarities of the thousands of people who crowded the garden and climbed in and out of the beautiful boats being shown.

They said, "The experienced power boat man, the fellow who really knows, devotes his time and attention immediately to the engine, the heart of the boat, while the novice stands off in adoration of 'her beautiful lines' or goes into raptures over the 'cute cabin,'" etc.

What Drives Your Boat

is of first importance. What are you depending upon to take you out and bring you back again, to buck the rollers, the tide and the current. Of what benefit is it to own a beautifully constructed and well finished power boat if you cannot absolutely depend upon your engine to do its work at any and all times. You can't feel safe to take your friends or your family out for a cruise nor can you engage in a speed contest with any assurance.

No Matter Who Builds Your Boat

insist upon a Loew-Victor Engine. Then the old bugaboo of boating—engine troubles—will be forgotten. They are made to run all the time and we have eliminated all the petty difficulties so common to ordinary gasoline engines. Simplicity, too, has been our watchword. Some of the big boat builders who are equipping their craft with LOEW-VICTOR ENGINES are aptly advertising:

"So Simple, That Even a Novice Can Operate It"

The parts are made accessible—everything in sight. The reverse gear and air compressor are both a part of the outfit. We ship our engines with all parts connected up, just as it left the testing blocks. No trouble to bolt it down in your boat. Connect up the gasoline and water and you're ready to start. No adjustments necessary, no connections with high tension cables, no attaching of carburetor or lining up of Reverse Gear—all done for you before we ship the engine.

Brief Specifications

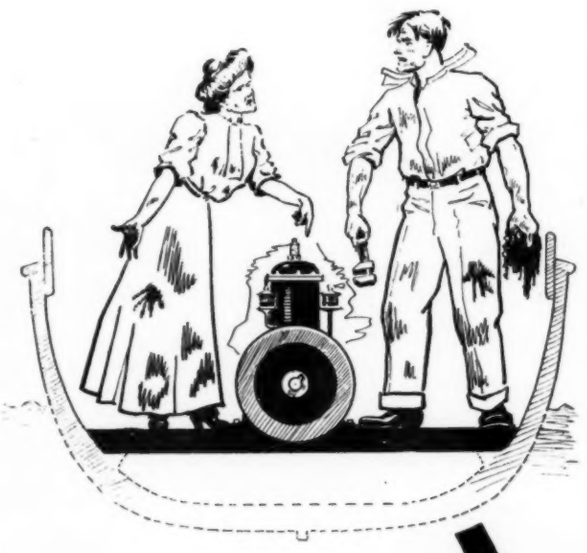
Type 4 cylinder, 4 cycle.
Size, 4½ x 5½.
Water Pump, Bronze of Plunger type.
Bearings, all crank case, and connecting rod bearings are die cast of white bronze metal.
Magneto, high tension Splitdorf.
Oiling system. Automatic plunger pump.
Carburetor "Schebler."
Reverse gear, our own; all bronze bushed gears in oil tight case.
Air compressor, air cooled type with fins for cooling.
Crank shaft; drop forging, 5 main bearings, 2 inch diameter.

Write today for catalog and detailed specifications. Tell us all about the work you want your engine to do. The style and size of your boat. We invite requests for bids on quantities from boat builders.

THE LOEW MFG. CO., West 90th St., Cleveland, O.

SINTZ

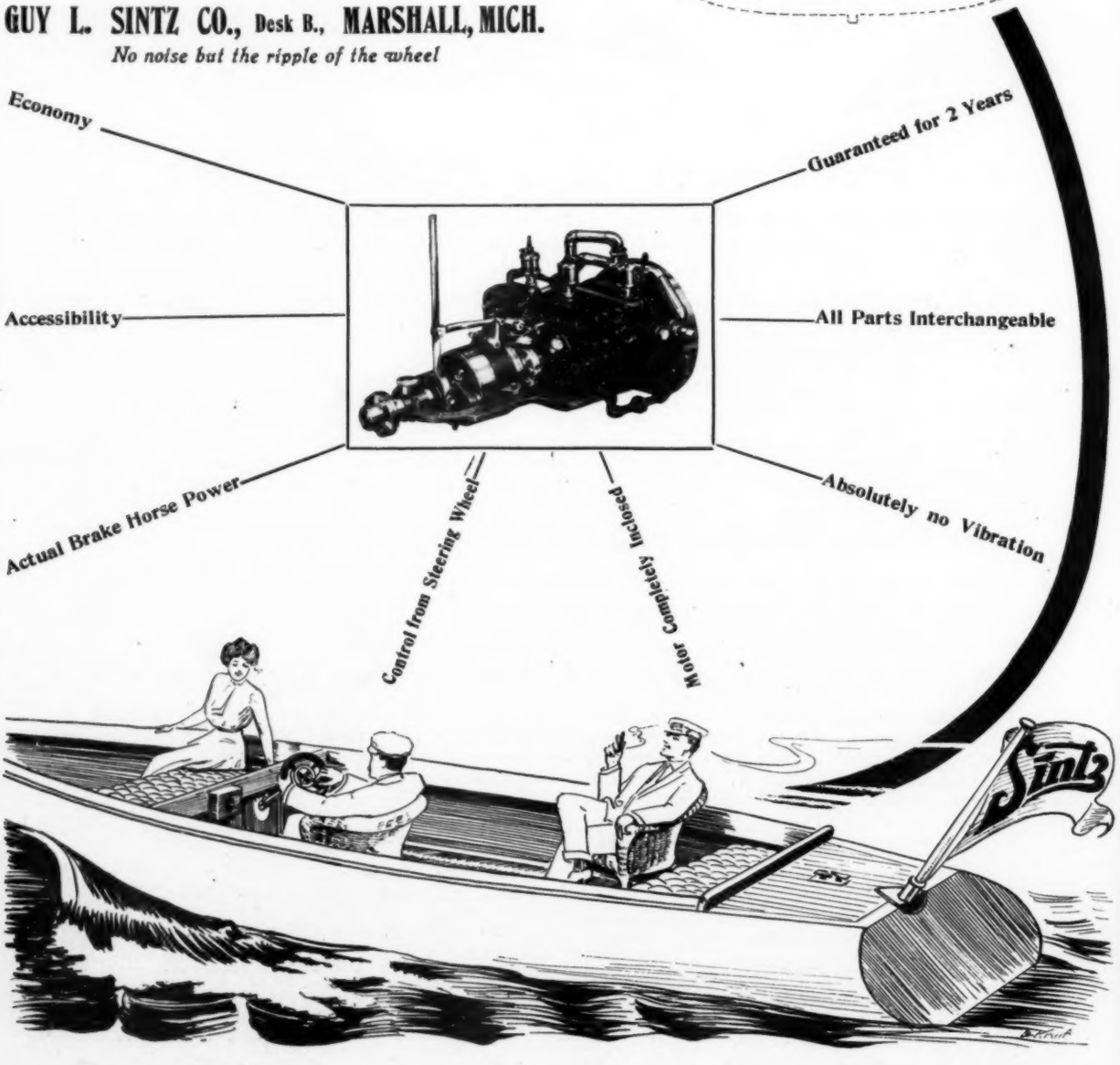
2 and 4 Cylinder Opposed Marine Motor. Sizes 6 to 40 H. P.



Mr. Boatman: We will furnish you a motor with low center of weight, materially increasing the stability of your Boat. One that you can install under seat, giving you greater seating capacity in a 25 foot Hull with one of our motors installed than you would have in any 30 foot Hull with a vertical motor installed. We can also furnish operating levers to operate your motor from steering post, giving the same perfect control as you have in your Touring Car. Write for full particulars to

GUY L. SINTZ CO., Desk B., MARSHALL, MICH.

No noise but the ripple of the wheel



The Sensation of the Season's Boat Shows

Only 50 of these Boats can be built this Season—22 have already been Snapped Up.

Other builders with limited capacity and old-fashioned methods, or any builder on earth who attempted to build one of these boats, would have to ask $3,500 to $5,000, but our price is $2,200 for the whole outfit.

The secret is perfect organization and the biggest boat factory on earth. Many boats make low prices—we build many boats.

Every detail of hull and fittings is up to the regular Racine standard, nothing scrimped, no pains of labor or material spared just to make the price low. The usual Racine guarantee covers the boat.

Here is a boat, a regular sea-going beauty, that will delight the most fastidious yachtsman. The more particular you are, the more "boat-wise," the more of a "motor boat crank" the better will you be pleased. It's a boat that is just as well suited, too, to the man who is just a novice, who is without boating experience. **You**, if you are this sort of a coming yachtsman, **will find** here no complication, nothing that you cannot understand and manage **yourself** with entire comfort and safety. This boat is the new

RACINE MUSKEGON

36-foot combination raised deck and trunk cabin off shore cruiser. **This boat is the biggest sensation of the boating year.**

BRIEF SPECIFICATIONS:

Head Room..... 6 ft. 0 in.
Draft ..... 2 ft. 4 in.
Beam ..... 8 ft. 8 in.
L. W. T..... 20 ft. 5 in.
L. O. A..... 36 ft. 0 in.

FRAMING—Throughout of sound white oak, except clamp of yellow pine. Frames steam bent. Galvanized fastenings throughout.

PLANKING—Long leaf yellow pine, 1 inch, all screw fastened.

COCKPIT—Ceiled and paneled in oak, ample for 10.

GASOLINE TANK—Latest type; all spillage or leakage outbound, removable without injury to woodwork.

CABIN—Sleeping accommodations for eight. Finished in best white enamel.

GALLEY—Thoroughly equipped, stove, etc.; ample cupboards and storage; ice box, water tank, etc.

RUDDER—Balanced type.

MOTOR—25 H. P., latest type.

DECK CONTROL—Engine and boat operated from cockpit.

FINDINGS—The equipment of this boat is the most complete ever produced. It includes everything ready for use and which are commonly called "extras." Delivered ready to take on gasoline and provisions and start on a cruise of any length without further bother. A complete cruiser at a stripped boat price.

A powerful motor of the latest type—4-cylinder, 4 cycle, self-starting, developing from 25 to 30 H. P.—with double ignition system, gear-driven magneto, all so simple that even a novice will have no trouble.

Everything that goes with a boat is included, dinghey and davits, lights, screens, standing tops, cushions, flags, signal mast and fittings, power whistle, fog bell, life preservers, boat hook, stove, removable table, etc. Wired for electric lights. Sounds like a marine catalogue, doesn't it?

You Can Own A Boat

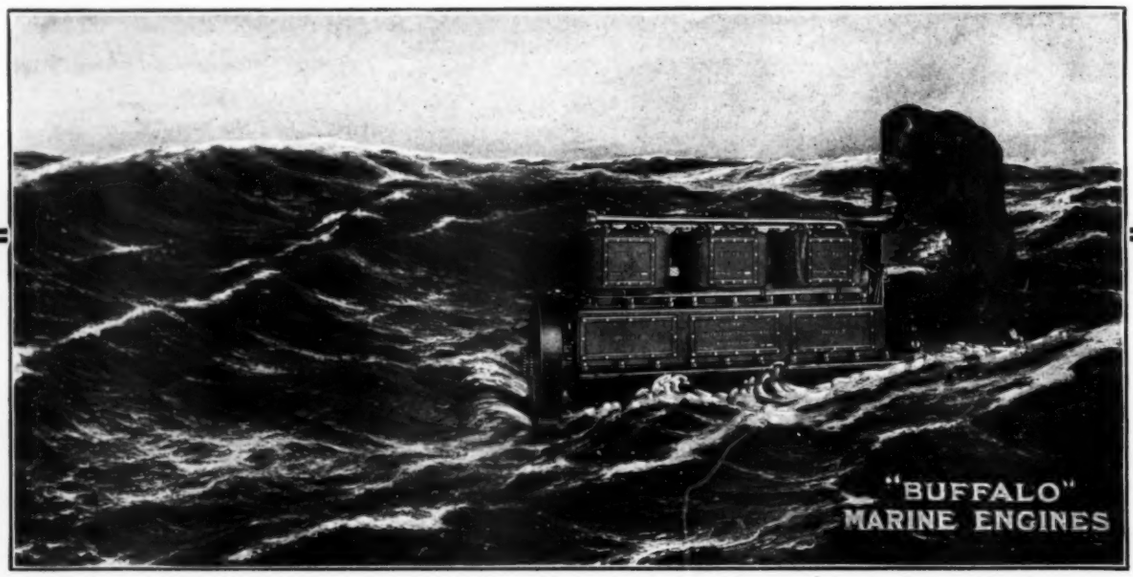
You can afford to own this boat and run it yourself. You will require no crew. If you are a novice perhaps you thought you could not afford a big power cruiser. It's a "one-man" boat, in the sense that you can handle it all by yourself, if you wish, and go anywhere. If you are an experienced motor yachtsman you can buy or have built for you no better boat than this, a perfect off-shore cruiser built for hard and continuous service with little or no upkeep.

We will gladly tell you about this newest member of the Racine family as well as the other boats we make—everything that goes on water from the largest to the smallest—our 28-foot cruiser at $1,000, a Speed boat at $300, a Power dory at $150, etc.

We Build Everything That Floats

Send for Blue Prints** and complete specifications of the biggest boat bargain in the history of Motor Boating. **Now being exhibited at the Motor Boat Show.

RACINE BOAT MFG. CO.
Dept. AA, MUSKEGON, MICH.
Chicago, Detroit, New York
Boston Philadelphia,
Seattle.



The Engine of Constant Service

FROM CANOE TO CRUISER

"An engine for any sort and size of boat." Twenty-two different engines---from 2 to 225 H.P. and from 1 to 8 cylinders---in Regular, Heavy Duty and High Speed Types.

Constant refinement of design, of course.
Improved construction, always.
But no better materials, or equipment, until science discovers them.
We have a new catalog. Just say so, and we'll send it.

BUFFALO GASOLENE MOTOR CO. 1204-1216 Niagara Street, Buffalo, N.Y.

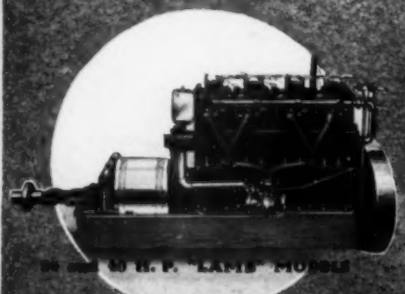
LAMB MARINE ENGINES

"It always goes and keeps going until I stop it."

The "Lamb" embodies every feature desirable in a Cruising Boat:
Accessible
Quiet
Clean
Flexible in Control
Equipment the best
Medium Weight
Medium Speed
Long Life
and carries the most up-to-date constructive features of any marine engine on the market.

Sizes
4 Cycle Engines
MEDIUM DUTY
3 Cylinder, 12-24 H. P.
4 Cylinder, 16 H. P.
4 Cylinder, 24 H. P.
6 Cylinder, 48 H. P.
HEAVY DUTY
4 Cylinder, 36 H. P.
4 Cylinder, 48 H. P.
6 Cylinder, 48 H. P.

Special Racing Engines to order only in 4, 6, 8 and 12 Cylinders



30 and 40 H. P. "LAMB" MOTORS

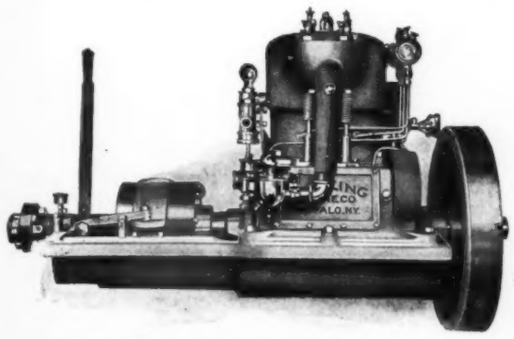
LAMB IV. 1909 CHAMPION M. V. P. B. 1

Our prices are right—send for catalog

LAMB BOAT & ENGINE CO. - - - - Dept. M. Clinton, Ia.
Members National Association Boat and Engine Manufacturers
LAMB ENGINE CO. OF NEW YORK - - Dept. M, 30 Church Street
Eastern distributors

STERLING QUALITY

GASOLINE ENGINES FOR ALL MARINE PURPOSES
BUILT IN SIZES 8 TO 240 HORSE POWER



8 H. P. 12 H. P. MODEL C—THE ENGINE

STERLING ENGINE COMPANY
1254 NIAGARA STREET

Milford, Del., Feb. 17th, 1910.

Sterling Engine Co.,
Buffalo, N. Y.

Gentlemen—I have had your 12 H. P. Sterling Fisherman engine in my boat "Edwin" since the first day of October, 1909. This boat is 21½ feet in length by 8 feet 2 inches beam, and easily makes 10 miles an hour.

It has been in use every day since the engine was installed towing oyster boats, and our creek is 18 miles' run each way, and we have made this run of 36 miles every day up to the present time, with the exception of three weeks in ice time. As far as the engine is concerned I have not had one minute's trouble with it since I had it put in the boat, and it is all that you claim it to be. If there is another one put here it will be a Sterling. It is the fourth engine I have had in this boat, and I would not give it for all of the others.

You can use my name in regards to the Sterling engine and you cannot praise it too highly, for she is a daisy.

Yours with best wishes. *James R. Conard.*

DEALERS:

H. L. Edge,
141 Liberty Street,
New York.

A. P. Homer,
88 Broad Street,
Boston, Mass.

EDWIN—THE BOAT.

DEALERS:

Edwin Kain Co.,
Bourse Building,
Philadelphia, Pa.

Chicago Boat and
Engine Co.,
1508 Michigan Ave.,
Chicago, Ill.

Kenyon Life Preserver Pillows and Cushions Have a Greater Sustaining Power Than Standard Life Preservers.

NOT only are the Kenyon Life Preserver Cushions and Pillows the best, the most durable, and most completely waterproof cushions made, but they will, also, in case of emergency, sustain a heavier body in the water for a longer time than the regular standard life preserver.

They contain no cork, but *do* contain a ***non-absorbent*** filling which makes them as soft as if filled with down.

Kenyon Life Preserver Pillow

Kenyon Life Preserver Cushion

They are made in the popular mission shape, covered with either leather or imitation leather, in tan, green or red.

They will support the heaviest person in the water for an indefinite period of time, and are far more buoyant than any regular life preserver made.

These famous Kenyon Life Preserver Cushions and Pillows are made in one stock size or in any size to order.

Send for illustrated descriptive price catalogue today---NOW.

Kenyon Boat Tops.

are folding tops for motor boats. They can be raised and lowered at will quickly and without inconvenience or damage to the material. They are so simple in construction that a glance at a Kenyon Auto Top instantly shows you how to handle it. They are light, strong, handsome and convenient

Write for catalogue which describes and illustrates the Kenyon Tops in detail.

The R. L. Kenyon Company
WAUKESHA, WISCONSIN, Dept. K.

THE BOSTON

8 Day High Grade CLOCKS for use on AUTOMOBILES and MOTOR BOATS

☞ Nothing but unusually large facilities, highest grade automatic machinery and a specially large force of highly skilled employees permits the Prices made on these Excellent Clocks.

☞ It gives the USER an excellent clock at (for the quality) a very moderate price.

☞ We give Discounts to Dealers and to Legitimate Jobbers, insuring a reasonable profit.

☞ The movements are all 8-Day, high grade, very rigidly built, are Jeweled and have Breguet Hairspring and Compensation Balances with Timing and Balance Screws, etc., and are secured by screws through back of the case—the best possible way.

☞ TO ORDER, and at $1.50 extra, we can equip any of these clocks with a "SET HAND" operated through the glass over the dial; a convenience in running short courses, especially in foggy or thick weather.

The above illustration shows the Actual Dial Size of all of the 3 inch sizes. The 3½ and 4 inch sizes are approximately relatively larger. There are 3 sizes of each Model —see Price List. All cases are of the approved "screw bezel," water and dust proof type and are made of Polished Brass—but "to order" will be finished Nickeled and other finishes.

EXCELLENT for use on AUTOMOBILES and MOTOR BOATS

—PRICE LIST—

MEMO—If any of these clocks are wanted fitted with our (patent applied for) STEM WIND and STEM SETTING Device, the most effective, compact and convenient device of the kind ever put on the market, ADD $2.50 to below list of Prices:

Size	Models A, B or C	Model D	Model E
3 inch	$15.00	$18.00	$21.00
3½ inch	$16.50	$21.00	$24.00
4 inch	$18.00	$24.00	$27.00

☞ JUST WHAT THE { DEALERS and USERS } HAVE BEEN WAITING FOR. { The QUALITY, STYLE and PRICE will appeal to all parties DEMANDING an EXCELLENT CLOCK

The Illustrations below show in Reduced Size the General Style of the various Models

Model A
In 3 sizes—see Price List

Model B
In 3 sizes—see Price List

Model C
Adjustable to various angles by Ratchet and Nut at back. In general appearance it closely matches many makes of speedometers.
In 3 sizes—see Price List.

Model D
In 3 sizes—see Price List

Secured to Dashboard by Safety Locking Device.

Model E
In 3 sizes—see Price List.

The Illustrations below show the (patent applied for) STEM WINDING and STEM SETTING Device.

On Models A, B and C it projects through side of case. On Models D and E it projects through bottom of case and eliminates seconds dials. Compact and effective. IF CLOCKS wanted FITTED with this device, ADD $2.50 to Price Lists.

TO DEALERS

This page, if cut out and kept, will make a good temporary, illustrated catalogue—as of date, December, 1909.

IN ORDERING, state the Model and Size wanted. ORDERS and Correspondence Solicited.

BOSTON CLOCK CO.
150 POST STREET
BOSTON, MASS., U. S. A.

MORGAN & ALLEN CO., 150 Pearl St.
San Francisco, California
Sales Agents, Pacific Coast

TO JEWELERS { During 1910 a quite complete line of our BOSTON Mantel Clocks will be ready

CAREY PRESS, N. Y.